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ELEMENTARY INDUSTRIAL WORK



GEORGE H. JENSEN, B. S.

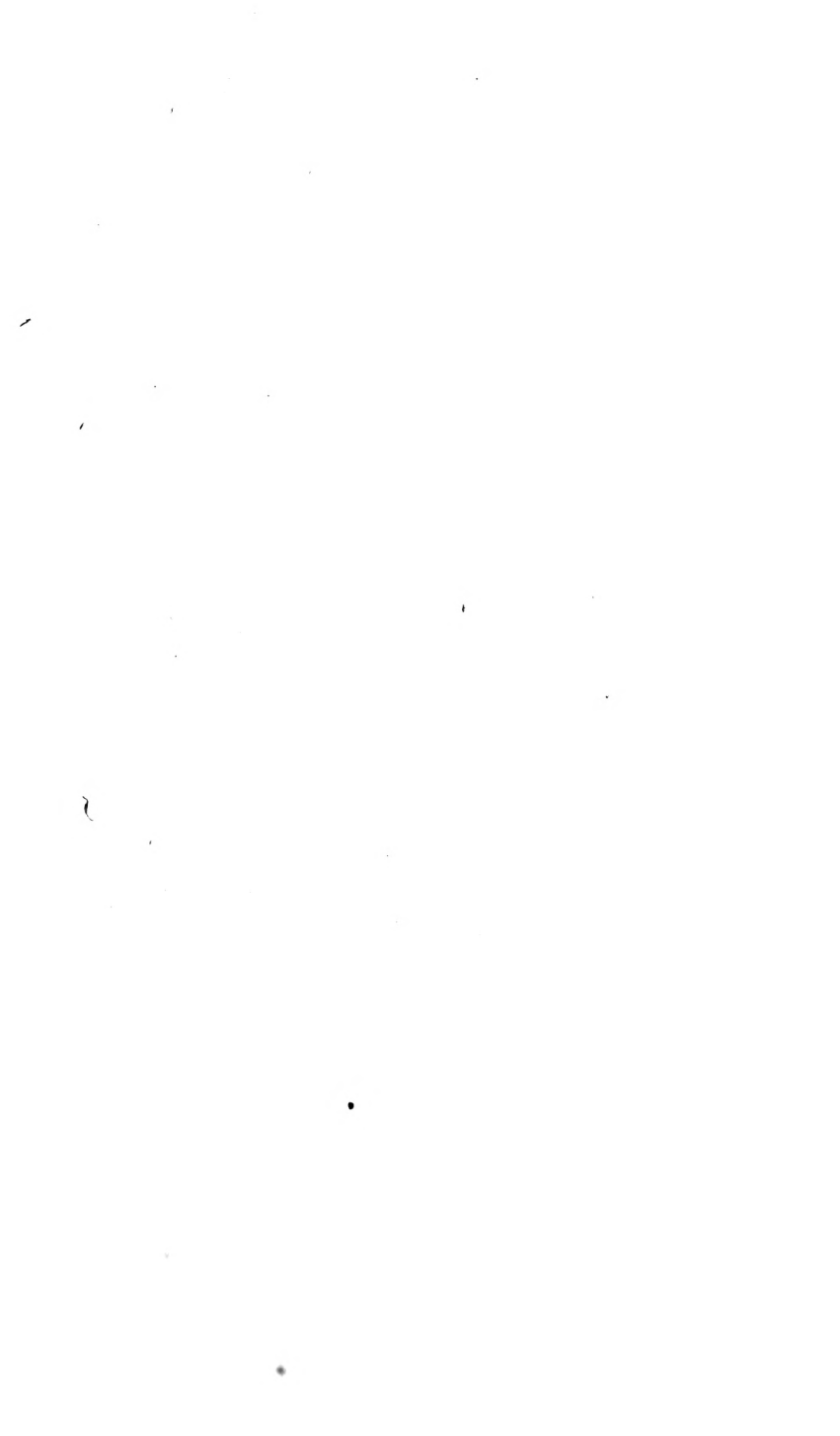


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ELEMENTARY INDUSTRIAL WORK

... BY ...

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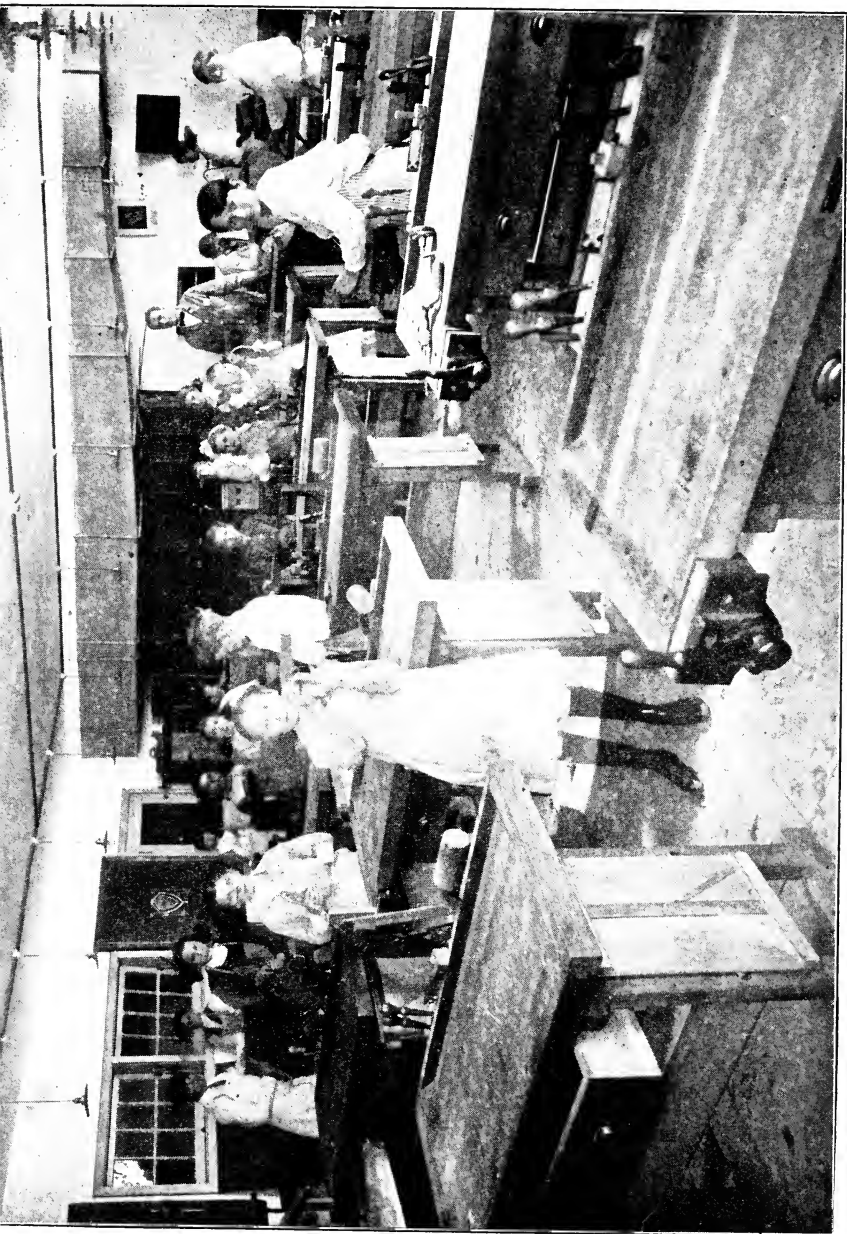
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PREFACE.

We are no longer required to prove to the public that training in the Manual Arts is an essential factor in any educational curriculum. We are frank to admit, however, that we are not conceited enough to say that we have learned the best methods of giving training along this line. The contents of this book are what seem to the author the best that has been found up to the present time for the particular phase of the work for which it is intended. Each problem has been selected only after careful testing in the classroom. All of them have demonstrated their practicability. In a general way, nearly everyone knows about the crafts problems and projects suitable for classwork. But when it comes to using them as such, trifling details, simple in themselves, come up and cause the proposed handwork to be omitted. The wise teacher who has not thoroly learned how to do the work readily, substitutes. Often a few simple suggestions would have cleared up all vagueness.

The material in this book is of such a nature that any "wideawake" teacher may with a little patience and application use it without an instructor.

The teaching of this subject has always been somewhat handicapped by the scarcity of text-books that are suitable. Most of them treat only some of the materials that may be used---it is the purpose of this book to treat all that are advisable.

Students in my classes have often asked that we have a text-book treating the subject-matter that we cover. In answer to this and the other demand referred to, this little volume has been prepared.

INTRODUCTION.

The title of this book does not mean to imply that we are to train for any trade, but it is evident that industrial training necessarily must be included in our curriculum when thirty of our thirty-two millions of workers must earn their living by the use of their hands. A mere "busy-work" period coming for its share of time is not sufficient. The work must stand for something definite, and tangible results must be in evidence. The standard of skilled labor demanded by the industries is already being raised. This elementary work paves the way for the shopwork which will come later.

Handwork is often an incentive to more concentrated application at other subjects. Pupils will work harder if they are looking forward to a period when they can lay aside their books and work with their hands.

While working, keep in mind design and proportion. It is just as easy to teach good proportion as it is to permit the development of a disregard for proportion, if the child is only guided in his efforts.

Never strive for quantity at the expense of quality. Honest constructions should always be adhered to, even tho imitations may shorten the work and be "just as good." Have your problems so graded that the children for whom they are planned can execute them in a creditable way. There are teachers who are wont to say that a certain execution is very good considering the age of the child---that is a poor standard. Plan the problems so that good results can be demanded.

Exhibits are a necessary evil. A great deal of time and effort are expended for same, which reduces the time for actual classwork, which is too short as it is. It is fortunate, of course, that parents and friends are interested in the results achieved by the children, but it is such a temptation to help the child in preparing his piece for the exhibit by executing parts of it that he cannot execute himself. The product then ceases to belong to the pupil and becomes the work of the teacher.

There are two general suggestions for methods of procedure that are worth while. In the lower grades, use the work in teaching history, industries, occupations, etc.; in the higher grades, constructions and technique should be mastered and emphasized. All of the time, however, initiative should be considered and developed.

The different phases of the work need not be taken up in the order of the chapters that follow. Each chapter begins with the simplest manipulation of the subject-matter of which it is treating, and leads up to the more difficult.

This book does not attempt to carry any of the crafts into the realm of professionalism. But since most schools, both rural and city, are doing work of this kind in the lower grades, this book hopes to accomplish its mission by helping those who study it to develop better and more sincere methods of instruction.

CONTENTS.

	PAGE.
CHAPTER I.	Mechanical Drawing 1
1.	A Simple Working Drawing 2
2.	Lettering 5
3.	Designs 9
4.	Geometric Problems 10
CHAPTER II.	Community Work 14
1.	A Barnyard Scene 16
2.	A Street Scene 18
3.	Doll-House Construction 23
4.	The Building of Houses 31
CHAPTER III.	Special-Day Exercises 36
1.	Holiday Season 37
2.	Envelopes 40
3.	Boxes 42
4.	St. Valentine 43
5.	Washington's Birthday 46
6.	Easter Season 49
7.	Hanging, Gift and May Baskets 51
CHAPTER IV.	Miscellaneous Paper Sloyd. 56
CHAPTER V.	Cord and String Work 66
1.	Watchchains 67
2.	Guard for Scissors 69
3.	Square Knot 70
4.	A Portiere 70
5.	A Small Bag 71
6.	The Double Sailor's Knot 72
7.	Whips 72
8.	A Hammock 74
CHAPTER VI.	Burlap Work. 76
1.	A Mat 76
2.	A Napkin Ring 77
3.	A Shaving-Pad 78
4.	A Holder 79
5.	A Needlebook 80

CONTENTS—Continued.

	PAGE.
6. A Cardcase	80
7. A Bag for Books	82
8. A Pincushion	82
9. Sofa Pillows	83
CHAPTER VII. Weaving	85
1. Single-Mat Weaving	87
2. A Woven Box	91
3. Right and Left Weaving	93
4. Hand-Loom Weaving	95
CHAPTER VIII. Raffia Work	109
1. Wrapped Work	110
2. Braided Work	115
3. Knotted Work	117
4. Porch Pillows	120
CHAPTER IX. Simple Bookbinding	123
1. Desk-Pads	124
2. Portfolios	127
3. A Simple Booklet	129
4. Another Book	130
5. Loose-Leaf Books	131
6. Art Books	133
CHAPTER X. Basketry	135
1. Reed Mats	136
2. How to Utilize Mats	142
3. Reed Baskets	145
4. Willow Baskets	151
5. Coiled Baskets	151
6. Hard-Coiled Baskets	153
7. Baskets of Natural Material	159
8. Flat Reed Baskets	160
CHAPTER XI. Design	163
1. Block-Printing	171
2. Stenciling	172
CHAPTER XII. Bird-Houses.	176
1. A Wren-House	176
2. A Larger Bird-House	179
3. Other Bird-Houses	181

I.

WORKING DRAWINGS.

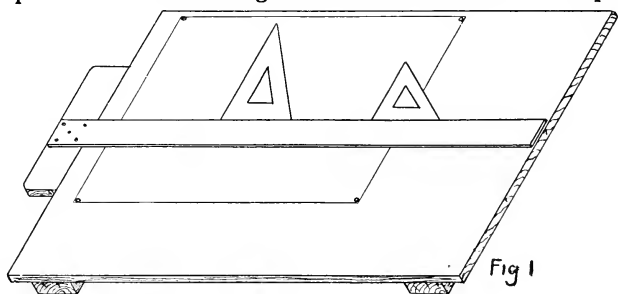
An understanding of simple working drawings is necessary for hand work of any form.

Mechanical drawing differs from free-hand work. In free-hand drawing things are represented as they are seen, or as they impress one. In mechanical drawing things are drawn as they exist, or really are.

In drawing any view of an object, either top, end or side, only two dimensions are used. Those are length and breadth. The point of view is assumed to be at an infinite distance from the object; therefore, no thickness or third dimension is considered.

Instruments shown in Figure 1 are essential, being a drawing-board, T-square, 30x60 and 45x45 degree triangles, and thumb-tacks. A compass will also be needed.

In using the T-square, the beam (part to which the blade is nailed) should be firmly held against the end of the board in order that all of the lines drawn will be parallel. The triangles are used to draw lines per-



pendicular to those drawn with the T-square and for drawing lines to make the various angles mentioned under Figure 1. The T-square may also be used from the top of the board if the upper left-hand corner is square so that the angle it makes with the line already drawn will be a right angle.

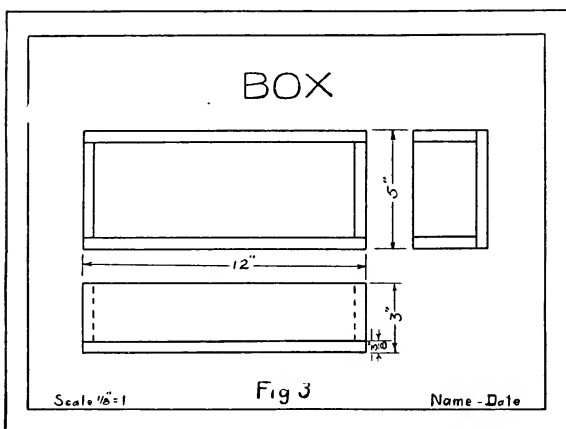
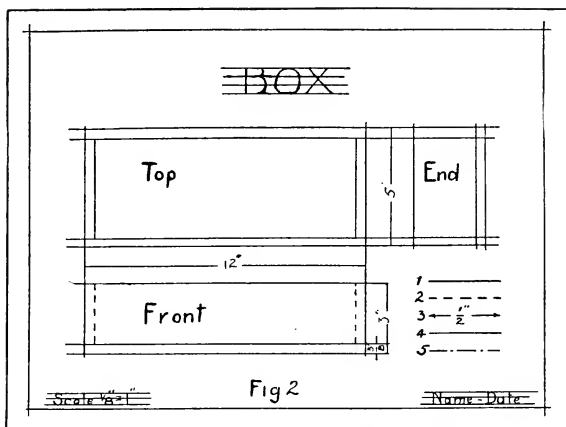
In addition to what has already been mentioned, Figure 1 also shows a sheet of drawing paper 9"x12" in place. The edge of the paper must be parallel with the blade of the T-square. This is easily done by fastening only one of the lower corners and then moving the paper until the upper edge is just in line with the T-square, when the other tacks may be inserted.

The character " to the right and above the Figures 9 and 12 in the preceding paragraph designates inches. If there is but one of these characters ('), that designates feet. These characters will be used thruout this book.

1. A SIMPLE WORKING DRAWING.

A simple working drawing is shown in Figure 2 with all construction lines and method of projection. Figure 3 shows the drawing complete, after inking in all necessary lines and erasing the construction lines.

The conventions in the lower right-hand corner of Figure 2 are not a part of that plate, but are for the purpose of learning their names. No. 1 is a line used to represent visible edges; No. 2, invisible edges; No. 3, dimension lines; No. 4, working or projection lines; and No. 5, center lines.



The first step in the making of a working drawing is the drawing of lines parallel with the four edges of the sheet, leaving a margin of $\frac{1}{2}$ " in case the sheet is 9"x12", the size of the sheet, of course, governing this width. This done, proceed to measure your

object, and, comparing it with the length and width of the area on which it is to be drawn, determine the scale. By scale is meant whether it is to be drawn full size, one-half size, one-quarter size, etc. The spaces to the right and left of the views drawn should be equal, but those above and below so arranged as to get a spacing that looks well.

Drawing to scale is sometimes confusing to beginners. The parts are drawn to scale, which makes the whole drawing proportionate, gaining a definite idea of the full-sized article; but, in putting in the dimensions, use those of the article itself, otherwise we would not be representing what we started out to draw.

In drawing the pencil lines, make them slightly longer than necessary, in order that they may cross at the corners, which will avoid errors in inking, since a part of the drawing is covered with the T-square or triangles.

The views are placed, as a rule, just as they are labeled in Figure 2—the top view with the end view to the right of it, and the side, or front, view directly below the top view. The top view is always drawn first, and most of the parts on the side and end view can be projected from this. By projection is meant the continuation of a certain line or lines in order to get a point or a part of the other view without measuring. The different views are never labeled in the real drawing, since the position for each view is fixed.

Begin, having the margin lines drawn, by drawing the long horizontal lines. Next space off on these by means of dots where the vertical lines will cross. Fol-

lowing this the shafts of the dimension lines are drawn.

The drawing is now ready for the insertion of dimensions, but first, draw lines to aid in the lettering and numbering. After drawing said lines as shown in Figure 2, do the lettering; but the barbs on the dimension lines are not drawn in pencil, since they are directly done free-hand and in ink.

The inking comes next. Ink the heavy lines first (visible and invisible), and then the lighter lines. Lastly, using a fine pen, ink in the letters, figures and barbs. Erase all pencil and finger marks, and the drawing is complete.

If Figures 2 and 3 are not understood after the foregoing explanation, examine a box and try to see the different views. The sides of the box are nailed to the ends, and the bottom is nailed on the lower edges of both sides and ends.

Get a better insight by making a few drawings similar to Figure 3 from models that may be had.

2. LETTERING.

Working drawings should never be labeled or marked in script. Script is not in keeping with the work, so the practice of the practical draftsman is followed.

The lettering may "make or break" a drawing. In other words, a drawing, tho perfectly drawn, presents a disagreeable appearance if poorly lettered. It does for the drawing what paint and decoration do for the house.

In our work in the grades we shall not aspire to

the skill acquired by a professional draftsman, but work away from top-heavy and poorly-proportioned letters.

Lettering immediately resolves itself into drawing and design. It is design until a properly sized, shaped and proportioned letter has been decided upon. The execution then is simply drawing.

The style commonly accepted is the plain "Gothic." It meets the requirements as to simplicity and ease of execution, making possible speed with practice. For work in the grades these should always be used except in designs where only a few letters are necessary.

In teaching the alphabet, first draw the letters free-hand on the blackboard, using four guide lines in the beginning. This is shown in the lettering on the plate in Figure 2.

The capitals, or upper case, Figure 4, should be taken up first. Have the pupils rule horizontal lines similar to those drawn on the board by the teacher. Discouragement can often be avoided in the beginning if the letters are not made too tall. It will be found that $\frac{3}{8}$ " is a good height. When the guide lines have been drawn, lettering may be started. It is not well to begin and letter from A to Z. H being the most fundamental letter, it may be taken first. The vertical parts must be made at a single stroke of the pencil and as nearly vertical as possible. The horizontal is then drawn in the center or slightly above the center. There is only one letter that has the cross or horizontal line below the center, which is A, altho the horizontal line in G is sometimes drawn below the center, which is permissible.



The width of the letters varies from I to W, but the majority of them are of the same width as that of the letter H.

After a line of H's has been drawn, the other letters in this group may be practiced—I, L, T, F, E and N—drawing the vertical lines first in each case.

The next letters to be studied are A, M, K, W, X, Y, Z. No new difficulties are presented. It should be noticed, tho, that the M and W differ in that the sides of the M are straight, while those of the W are drawn at an angle. This angle should not be very large, or the letter will look weak. The Y should not be made too wide, or it will look top-heavy.

The letters involving curved lines are taken up next—U, J, O, Q, C, D, G, P, R, B, S. U and J are made by adding curves to the horizontal lines. The letter O is made by drawing a left-hand curve

from top to bottom, and then a right-hand curve, joining at the top and bottom. What has been said about the U, J and O will make the others possible. In S care should be taken to avoid making the lower half smaller than the upper half.

The numerals in Figure 6 are studied next. Only the 6, 8 and 9 need analysis. The 6 and 9 are drawn as indicated by the numbers on the figures in Figure 6, 1 being the first stroke, and 2 the second. The number 8 is made up of two ovals, the upper one being slightly smaller than the lower one.

The lower-case letters (Figure 5) are practiced last. No difficulty should be experienced. Keep the straight lines horizontal. Only after considerable practice is it wise to attempt either upper case, lower case or numerals at an angle as shown in Figure 7.

The width of the letters has been mentioned, but not in proportion to the height. This varies considerably; but, if it is figured mechanically, two-thirds is a safe proportion for average lettering. For sake of variety, or because of the smallness of the space, letters can be drawn much narrower in proportion to the height. These are called *condensed*, and show in the plate on lettering. When they are much wider in proportion to the height, they are called *extended*.

Spacing is a very important consideration. Area of space between the letters should be equal or nearly so, rather than the actual distance in a horizontal line from one letter to another. If the spaces are equal in width, dark spots will appear. Therefore, H and E coming together should be more widely separated than E and F, or F and J. And even F and J can

be drawn closer together than E and F. The eye must learn to gauge the proper spaces, as no set rule will always effect good spacing. T can be made to overlap the letter preceding or following it, and Y and T coming together are sometimes narrowed.

The letters should now be drawn with the aid of only two guide lines. But never attempt to letter without any guide lines, altho some are able to work with but one, which is the reward of persevering practice.

3. DESIGNS.

It is desirable, even in the lower grades, to design titles, valentines, illuminated initials, posters, portfolios, etc., involving more elaborate lettering than has been studied up to this time.

The block letters just below Figure 8 are the simplest of these, since they can be drawn without the aid of instruments.

By the addition of serifs (labeled A in Figure 9) and spurs (labeled B in Figure 9) we make of the block a full-block letter.

The "Classic Roman" (Figure 8) is an alphabet drawn in outline. This affords a letter that can be colored, which is quite effective.

The "Italian Renaissance" (Figure 9) is quite similar to the "Classic Roman," but executed in solid and not in outline.

Those desiring to elaborate along this line have only to notice what is around them. Window signs, magazine covers, headlines in magazines, and various magazine advertisements, provide ample material for many and varied letters and executions.

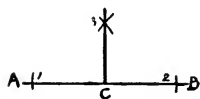


Fig 10

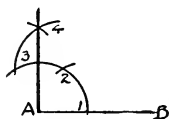


Fig 11

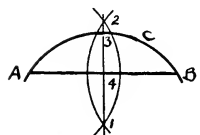


Fig 12

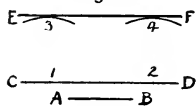


Fig 13

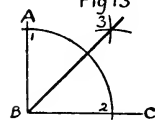


Fig 14

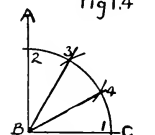


Fig 15

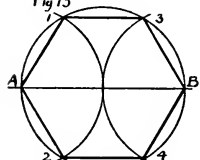


Fig 16

4. GEOMETRIC PROBLEMS.

In executing the different problems in hand-work construction and design some geometric constructions are necessary. Only those most frequently used will be given. The problems are to be worked out by means of the ruler and compass. The T-square with triangles is not to be used here, since we are brought in contact with these problems when drawing board, T-square and triangles are not available.

In the solution of a geometric problem we have three parts: First, that which is given; second, the construction; third, that which is required. The part required in the problem is drawn heavier in the figure than parts 1 and 2.

1—*To draw a perpendicular to a given line at a given point in the line* (Figure 10): With C as center, and a radius less than CA or CB, strike arcs at 1 and 2. With 1 and 2 as centers, and a radius greater than one-half the distance from 1 to 2, strike arcs intersecting at 3. Draw a line from point C passing thru 3, which is the perpendicular required.

II—*To draw a perpendicular at the end of a given line* (Figure 11): With A as center, and any radius, draw an arc, nearly a semicircle, cutting the line AB at 1. With 1 as center, and with the same radius, strike an arc cutting this arc at 2. With 2 as center, and with the same radius, strike the arc 3-4. With 3 as center, and with the same radius, cut the arc 3-4 in four. A line drawn from point A thru the intersection at 4 is the required perpendicular.

III—*To bisect a given straight line or an arc of a circle* (Figure 12): Take A and B as centers, with a radius greater than one-half of AB, strike arcs intersecting at 1 and 2. Draw line passing thru 1 and 2 which passed thru 3 and 4, bisecting both arc and line. This line is also perpendicular to the straight line AB.

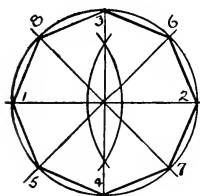
IV—*To draw a line parallel to a given line at a given distance* (Figure 13): Let CD be the given line and AB the given distance. With 1 and 2 as centers (any two points in the line CD), and radius AB, strike arcs 3 and 4; then draw EF, the required line.

V—*To bisect a given angle* (Figure 14): With B, in the ABC, as center, strike an arc intersecting AB and BC in 1 and 2. With 1 and 2 as centers, and any radius greater than one-half the distance from 1 to 2, strike arcs intersecting at 3. Draw the line B3 which bisects the angle ABC.

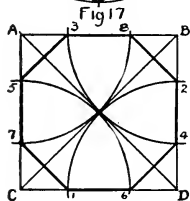
VI—*To trisect a right angle* (Figure 15): With B as center, and any radius, strike an arc intersecting A and C in 1 and 2. With the same radius take 1 and 2 as centers, and cut the arc in 3 and 4. Draw B3 and B4, trisecting the right angle.

VII—*To inscribe a regular hexagon within a given circle* (Figure 16): Draw a diameter cutting the circle at A and B. With A and B as centers, and the radius of the circle as radius, strike arcs cutting the circumference at 1, 2, 3 and 4. Draw 1-3, 3B, B4, 4-2, 2A, A1, and the inscribed figure is the regular hexagon.

To divide a circle into three equal parts (Figure 16): Draw lines from 1, 2 and B to the center instead of joining the points in the circumference to form the hexagon.



To divide a semicircle into three equal parts (Figure 16): Draw lines from 1 and 3 to the center of the line AB. This applies to the upper half of the figure.



VIII—*To inscribe a regular octagon within a given circle* (Figure 17): Draw a diameter cutting the circumference at 1 and 2, then draw another diameter at right angles to the first one, cutting the circumference at 3 and 4. Bisect the right angles thus formed, cutting the circumference at 5, 6, 7 and 8. Draw lines connecting the intersections in the circumference, and the inscribed figure is the regular octagon.

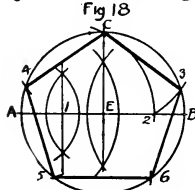


Fig 19

IX—*To construct a regular octagon within a given square* (Figure 18): With ABDC the given square, draw diagonals intersecting at the center. With A, B,

C and D as centers, and a radius equal to one-half of the diagonal as radius, strike arcs intersecting the sides of the square in points 1, 2, 3, 4, 5, 6, 7 and 8. Draw 5-3, 8-2, 4-6 and 1-7, making the required octagon.

X—*To inscribe a regular pentagon within a given circle* (Figure 19): Draw a diameter AB and a radius EC perpendicular to it. Bisect AE at 1. With 1 as a center, and radius 1C, cut the diameter AB at 2. With C as a center, and radius C2, strike an arc cutting the circumference at 3. C3 is a side of the required pentagon. Set off this distance on the circumference five times. Draw 4C, C3, 3-6, 6-5 and 5-4, and the required pentagon is complete.

II.

COMMUNITY WORK.

In a genuine course of hand-work two things should be sought for: First, the interrelation of different problems; secondly, there should be something about the work that should make each phase or part of it contribute to the whole of the year's work and not let any one part of it be an isolated fragment. And this second, which is sometimes violated in trying to overcome the first, is a flexible program prescribed by the immediate surroundings and interests of the children. It is never advisable to have a fixed and definite program to be carried out in every room of the grade for which it is intended. No flexibility is in evidence and the imagination is hampered.

In choosing the form of community work to be executed, care should be exercised so as to avoid anything that will necessitate elaborate material or equipment. Children should be permitted to select the problem to be executed, but the teacher can always get them to choose something possible. Any local industry can be worked out in a simple way. An excursion or visit to the factory should always precede the beginning of the work.

Since most of the community work is construction from paper and cardboard, do not try to exclude all other material. Weaving, clay modeling, and the use of splints and reeds are often resorted to; and, since this often takes up several months, work

for the special days must receive its share of time in due season. Exercises for Thanksgiving, Christmas, Valentine Day, Washington's Birthday, etc., are used to advantage.

Among the most possible executions in the form of community work are the following:

1. A barnyard scene, including the building of fences, representation of fowls and animals, foliage, etc.
2. Street scenes, including houses, stores, churches, carts, wagons, telegraph poles and wires, trees, etc.
3. Railway stations, including station, freight and passenger cars, cabs, automobiles, engines, etc.
4. A dollhouse constructed of dry-goods boxes. Furnishing to include not alone furniture, but the covering for the walls and floors, and curtains for the windows.
5. Indian life in connection with Hiawatha.
6. History of transportation.
7. Industries, as lumbering, mining, cotton, etc.
8. Eskimo life.
9. Modern villages, giving attention to, or using it to teach sanitation and to give some definite ideas about the planning of homes.

(When using the same industry or scene for different rooms of the same grade be sure that each room carries a distinction of its own, so that it will not be executed in precisely the same way as the others.)

What has been suggested is applicable to the first three or four grades. And No. 9 is applicable to the upper grades.

The paper for this work should be rather heavy. Any of the construction papers are good, and bogus paper which is used for many purposes is quite desirable, since it takes crayon so well.

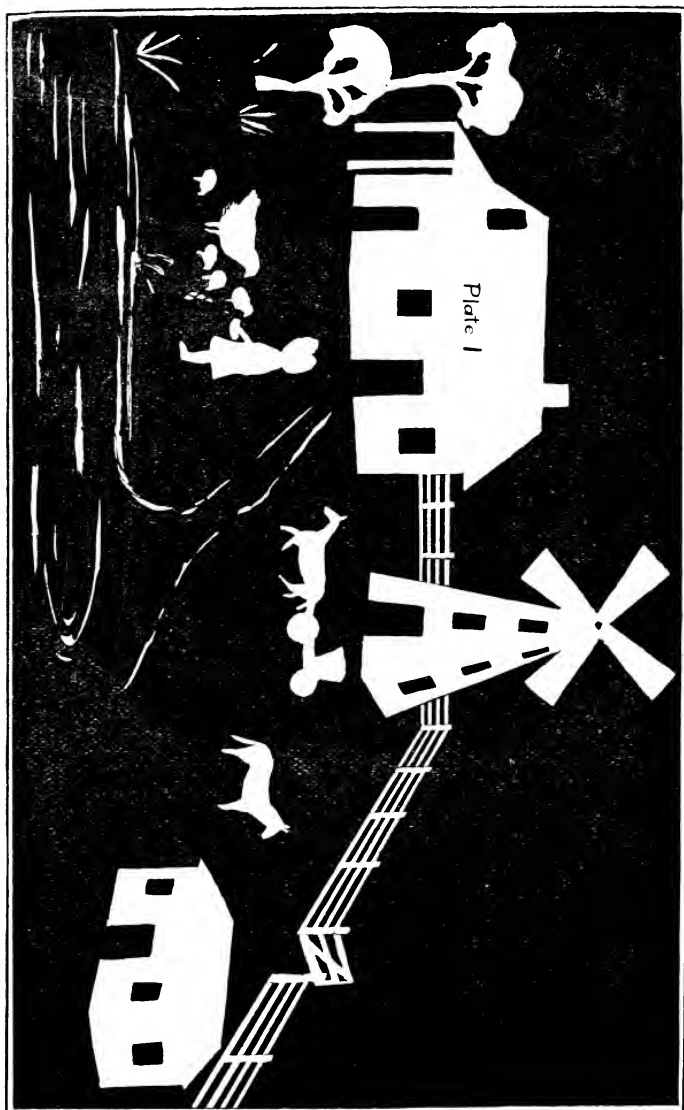
The best way to use paste is to cut small pieces of cardboard and put a small amount of paste on a piece for each child, returning the paste that is not used to the jar. A formula for paste is given in the chapter on Miscellaneous Paper Sloyd, page 56.

1. A BARNYARD SCENE.

White paper, scissors and paste are needed for this problem. It is well to have the blunt-pointed scissors, so that the young children will not injure themselves. The cuttings are free-hand, and then pasted on the blackboard. After the work is finished the paste is easily removed by washing, and you have a fresh, clean board.

This is probably one of the simplest forms of community work, and makes an excellent problem for the first grade. Silhouette work is of the same type where the cutting is done in black paper and mounted on white or manila paper. The scene illustrated in plate 1 is only one of the many possible ones. Story-telling can be illustrated in an interesting and fascinating way.

After the subject has been decided upon, let each child decide upon the things he will have in his barnyard. Then permit him to cut free-hand. You will be surprised at the originality that some will show.



Do not infer that the cuttings of all of the different things are to be made at one sitting. Decide upon an animal or object for each lesson, and then have each one cut a number of these and select some of the best ones for mounting. It is not wise to devote too long a period, since the children become tired and possibly their interest will wane.

After enough subjects have been gone over to complete the group the mounting is taken up. Let the children assist in the arrangement. This is favorable to the blackboard, since the children can remain seated while the teacher or one of the pupils does the pasting, and in mounting the silhouette work this is not always possible. Emphasize the point that those objects nearest them appear larger than the ones farther away.

The road and the water in plate 1 were done in crayon. This could be done to a certain extent along with the cuttings.

If so desired, a hen-house could be added to the scene. And that would include coops and additional chickens. The field just beyond the barnyard gate might also be utilized by having a man working the soil with the aid of a team of horses.

As a rule this problem will be of interest to the children long after it has been completed. But remember that it is worth while even tho the interest is only transitory.

2. A STREET SCENE.

This is best worked out on the sand table. It is just a little in advance of the barnyard scene, and may be used to advantage in the second grade, and

with some elaboration may be repeated in the third and fourth if necessary.

If no sand table is at hand, one can be readily made by nailing strips of 1"x4" to the edges of a table, so that they project three inches above the top, and then sawing the legs so that it will be of a convenient height for the children to work at. Any clean sand can be used. If no sand table can be made, use a large shelf or the top of a table which has been covered with paper.

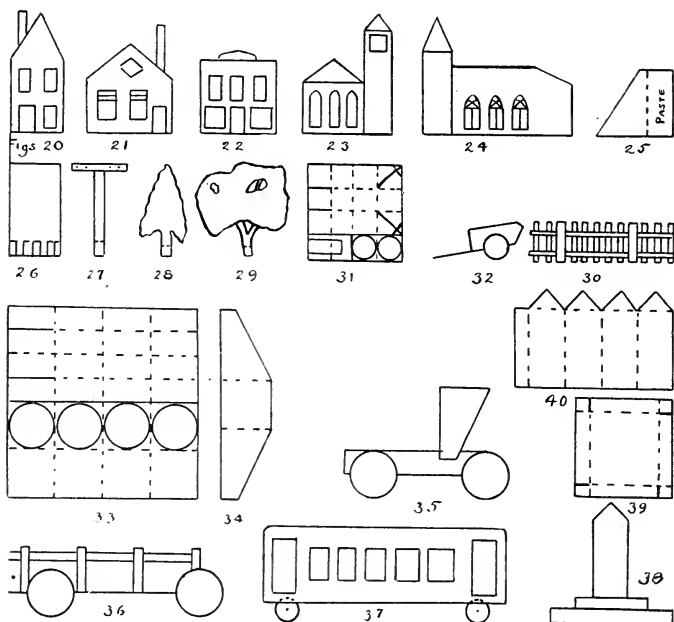
If this problem is being executed in a city, then a certain street, or a part of one, can be decided upon. In the country teach them about the city by means of this problem. Have the children work from memory, and begin by cutting outlines of the buildings, and then represent the doors and windows as well as other parts of a single view by the use of pencil or crayon. Figures 20 and 21 show two different houses. Since we are to represent but one view of the house, and that by a single sheet of paper, some kind of a support is necessary. Figure 25 is designed for that purpose. Fold on the dotted line, and paste the part indicated to the back of the part to be supported.

If the paper is fairly stiff, only one support is necessary.

The store in Figure 22 may be used to advantage, and can be varied if a shopping district is being executed.

The churches in Figures 23 and 24 are typical forms.

The piece of paper in Figure 26 is to be rolled and pasted for a telephone pole, and a cross-arm pasted at the top. If used on the sand table, the end is simply pushed into the sand; but, if used on the table or



shelf, one end is cut as indicated, and, bending on the dotted lines, the parts are pasted to the table. The one in Figure 27 is much simpler, since the pole and cross-arm are cut out in the flat and supported in the same manner.

In Figures 28 and 29 are shown two representations of trees. They are cut out in the flat, and supported in the same manner as the telephone poles.

The fence in Figure 30 is made and supported as in the first five figures in the plate; but, in using this with more advanced pupils, spaces can be cut out between the pickets, also some of the other problems might have openings cut for windows, doors, etc.

Figure 32 can be represented in the flat and supported, which is advisable for lower grades. The construction for the cart in three dimensions is shown in Figure 31. A square piece of paper is folded into sixteen squares. Cut on the solid lines, and fold and paste. The dotted lines represent the folded lines. The wheels are pasted to the sides of the cart and the shafts to the bottom.

The wagon with a top in Figure 35 can also be represented in the flat or constructed in three dimensions. A square (Figure 33) is folded, and then cut on the solid lines as indicated. Figure 34, used for the top, is not a separate piece in addition to the square, but is cut from the row of four squares at the bottom of Figure 33. The pasting is similar to that of the cart. The body of the wagon is open in the rear. This body can be shortened, in which case a buggy will appear.

No construction is given for the dray in Figure 36. This can be worked out, however, if the previous constructions have been executed.

The street car in Figure 37 is slightly different, being more like an inverted box with the ends closed. The wheels are pasted on the inside, as indicated by the dotted lines, and are smaller than those on the wagon.

A monument, such as we find in various cities, usually in a public square, is shown in Figure 38. The constructions (Figures 39 and 40) are self-explanatory. No flaps are shown for securing one to the other when the smaller one is placed upon the larger. These may be added if the pupils are advanced enough.

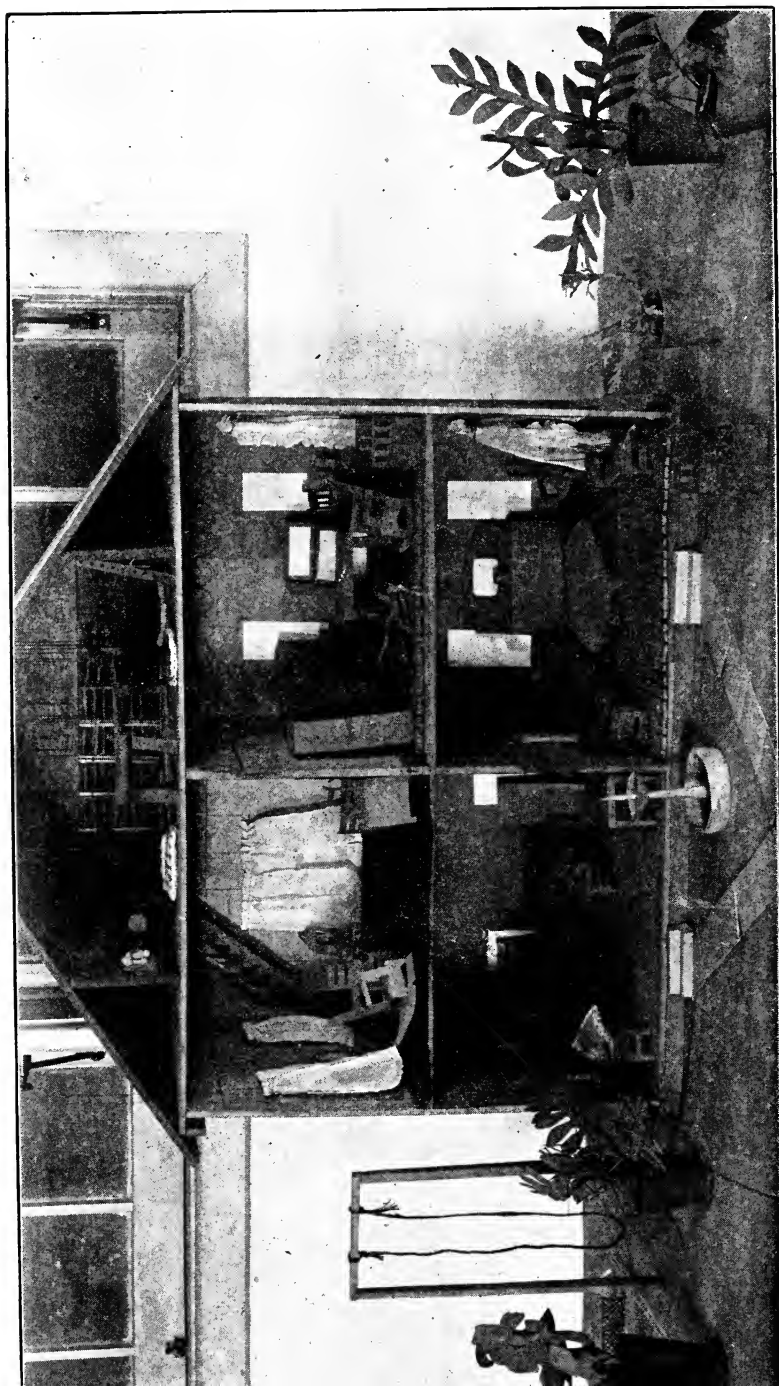


Plate 2.

3. DOLL-HOUSE CONSTRUCTION.

This can be used to advantage in any of the first three grades.

It is necessary to first have the house, and then construct the furniture, tint or paper the walls, and treat the floors, because furniture is *never* bought and then a house built to suit the furniture. The teacher will remember that, either consciously or unconsciously, he will teach these children things about home-building that will influence them very materially in their later life in reference to home-building as well as its furnishings. So let us be extremely careful that we teach nothing that is vulgar or untruthful. Keep to the simple constructions involving few curves, and let the decorations be simple if any is necessary. Simple furnishings and furniture are not only more beautiful and artistic, but more sanitary. They are sanitary, since straight edges and smooth surfaces do not provide a place for dust to accumulate and germs to breed. Highly-carved furniture, even when well cared for, is dusty nearly all of the time.

To make the house itself use dry-goods or soap boxes. They are placed on their sides with the top or open part of the box representing the front of the house. Notice the box in Plate 2. If the box is large enough a partition can be added, which divides the box into two stories. Then, by nailing parts of another box together, a gable roof is formed. If the boxes are small, one can be placed upon the other, forming the two stories in that manner, which is a much

simpler operation. Each of these stories may then be divided into rooms. Windows are cut, and casings may or may not be made, depending upon the facilities. Cigar boxes cut into strips make good material for casings. If the house is to be painted, do so at this time. A very small can of paint bought at a drugstore is sufficient, or some boy will usually volunteer to bring the paint from home. The tools needed are a saw and a hammer. These may be had in the same way as suggested with reference to the paint. A steel square can also be used to advantage, but is not absolutely necessary. The nails extracted from the boxes will prove ample.

The walls of the kitchen may be covered with paper tinted gray. Then a wainscoting is also desirable, and can be made from strawboard, ruling pencil lines to represent the beading. If no special material has been provided, tablet backs can be used.

The paper in the bedroom may be decorated by the repetition of some simple unit. Chapter XI may be consulted.

The dining-room may be a plain color, beginning on the lower parts of the wall, and gradually becoming thinner until it is a light wash on the ceiling.

For the floor in the kitchen use designed linoleum, to be executed in black or appropriate color. Folding manila is a most excellent paper for this, but other paper can be used. The designs worked out in single-mat weaving in the chapter on weaving afford excellent suggestions for this design.

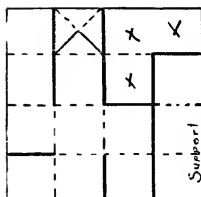
If matting is wanted for one of the rooms—say, the dining-room—it can be woven from raffia. This weaving is also given in the chapter on weaving.

Rugs are described in the same chapter. Four small rugs can be woven and sewed together, forming an art square. If a pattern is involved, each fourth has a part of the pattern, and will be complete when the four are put together. The Figures 41-64 are quite complete, the dotted lines representing folded lines, and the solid ones cut lines. Uniform-sized squares of bogus or construction papers are used. Convenient sizes are 6" or 8".

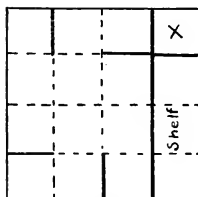
The constructions are all based on the sixteen squares. The folding should be done in concert as described in the chapter on weaving under the heading "Right and Left Weaving." Brown wrapping-paper is a good substitute for the papers mentioned.

If this text is being used without an instructor, do not attempt to interpret the figures by merely glancing over them. Take a square of paper, and fold and cut as you attempt to read the figure, and success is assured.

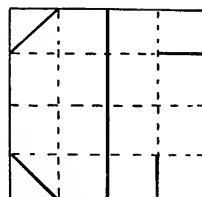
After folding Figure 41, cut on the solid lines, and then, putting the large piece together, a chair is constructed. The squares that have a cross in them fall away and are not used. The seat will be one square from the floor, with the back two squares in height. The children will probably suggest of their own accord that the back is too tall. Draw diagonals in the upper square, and cut as in Figure 41. If the children are not yet familiar with the term "diagonal," this affords an easy opportunity of teaching it. The three squares marked "support" are to be pasted on the back of the chair, making it stronger. It saves time to do this at the time of pasting and before the back is cut down.



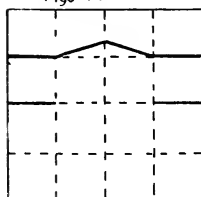
Figs 41



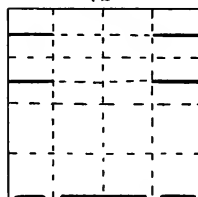
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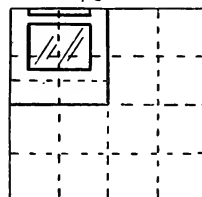
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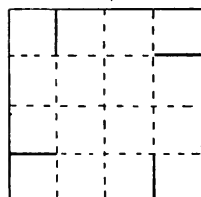
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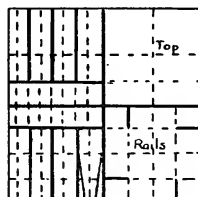
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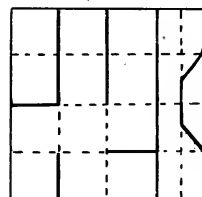
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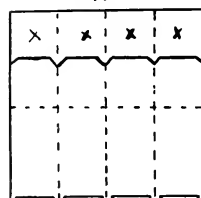
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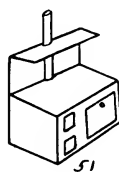
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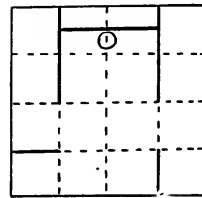
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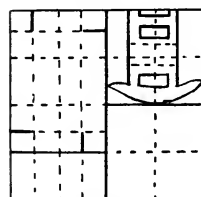
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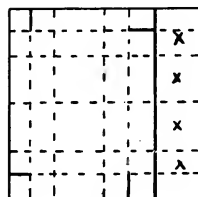
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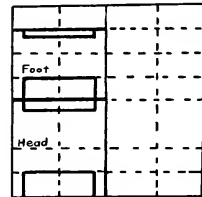
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54



55

Figure 42 (the cupboard) is put together just like a box. Then the three squares labeled "shelf" adjust themselves without difficulty.

The settee in Figure 43 is cut as indicated, and put together by using the part with the diagonal cuttings for the backs and arms. This makes the seat one square in height and the back the same. The half for the seat is first folded and pasted and the back and arms pasted around it. The washstand (Figure 44) is easily solved. The back is folded up after folding, and the stand is complete. Places can be cut at the bottom the same as on the chiffoniere in Figure 45.

Too, drawers and a door are represented on the paper in crayon or pencil. The chiffoniere (Figures 45 and 46) is similar to the washstand. After constructing Figure 45 cut out Figure 46, and paste a piece of white paper (Japanese rice paper is excellent) over the opening and on the back side to form the mirror. This is then fastened to the back of the body of the chiffoniere by pasting, having the top edge coming to the folded line below the mirror.

Figures 47 and 48 show two tables. The one in 47 is like an inverted box with the legs added. The one in Figure 48 is made by first getting out the rails, which are made like an inverted box. The top is pasted on the rails, having it project over an equal distance on the four sides. Add the legs, and the table is complete. The tapers are added as indicated in the one that is adjoining the rails in Figure 8. This is more readily done by cutting them out square, folding and cutting the two edges at the same time. The Morris chair (Figure 49) is similar to the straight

chair in Figure 41. In reality it should be somewhat larger than the straight chair. It is constructed in the same manner, and then the four squares are pasted around the chair, forming the arms. This also inclines the back of the chair.

Figures 50-52 are self-explanatory. The four squares that fall away in making the screen (Figure 50) may be used to make the pipe for the stove. The doors represented in Figure 51 are done in pencil, as mentioned in Figure 44. In fact, all of these pieces of furniture should have doors, etc., represented in pencil. This also includes the cover for the stove. Figure 52, after cutting, readily becomes Figure 51.

Two ends are needed for the cradle in Figure 53. The design drawn is by no means the only one. Where necessary it can be made much simpler. The body is folded and cut as indicated, and an end with the rocker attached is pasted at either end. The bed in Figures 54 and 55 is so similar to the cradle that it will not be necessary to describe it.

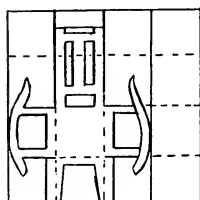
The rocker (Figure 56) is typical of the manner in which any of these constructions can be elaborated upon.

The tabouret in Figure 57 shows two forms of decoration for the sides. There are many others, but avoid sharp curves and angles.

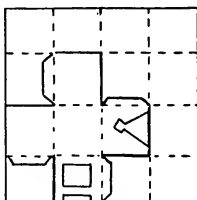
Figure 58 is a davenport readily constructed from the figure. Seats for the lawn can be made in a similar manner.

Figure 59 is the construction for the body of a swing which is to be suspended similar to a porch swing. The construction is readily worked out from the figure, the seat being pasted to the inside after

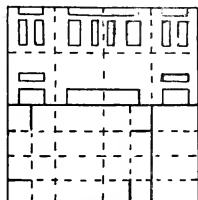
the body has been finished. Strips of pasteboard with one end bent may be crossed to make supports and the bent ends pasted to the floor.



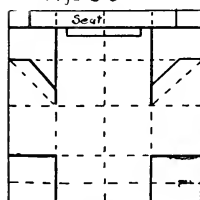
Figs 56



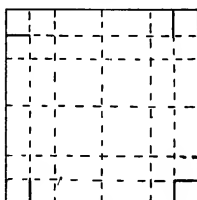
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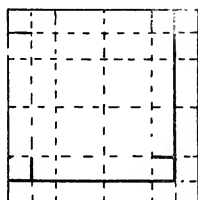
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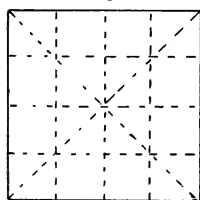
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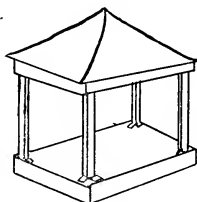
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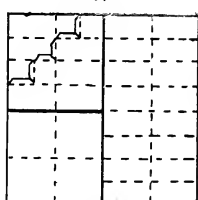
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63



64

Figures 60-62 show the construction for the summer-house in Figure 63. The base or floor is shown in Figure 60, and the support (Figure 61) for the roof (Figure 62.) The posts shown in Figure 63, on which the support for the roof is placed, are not represented by a construction. Flat splints may be used, or posts can be made of paper with flaps at either end for pasting. The summer-house is a val-

uable addition to the lawn if a large table-top or shelf is used to support the doll-house.

The steps in Figure 64 are necessary where the doll-house has a foundation. Only two steps are ordinarily required. Figure 64 makes an excellent grand-stand if working out a project that demands it.

A broom is constructed by securing a number of short pieces of raffia to one end of a small splint, and fraying out the raffia with a pin.

Any other articles of furniture desired in a scheme of this kind are readily worked out if the twenty-four figures given are understood. Simply study the piece of furniture you wish to make, and then take the folded square and begin operation. Stopping to think how difficult it will be never does anything but harm.

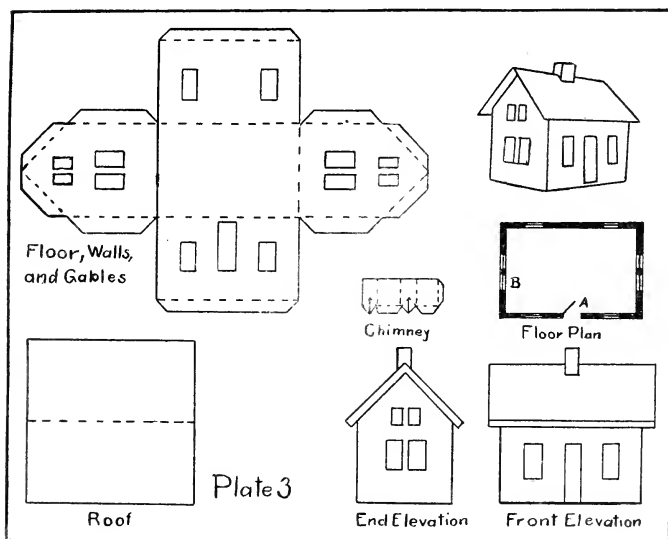
Such additional-articles of furniture as pianos, bookcases, writing-desks and kitchen cabinets are desirable.

No constructions for the gymnasium shown in the attic of Plate 2 are given. These are readily executed, some of them even without studying the objects themselves, as ladders, dumbbells, Indian clubs, mats, trapezes, etc.

As has been suggested in Figures 58 and 63, the yard is a part of the general scheme. Bogus paper makes good concrete walks. Trees and shrubs are constructed from green paper. Green twigs should be avoided if possible, since they dry up and are not a good representation of shrubbery. With very young children, however, it is permissible. Tennis courts and swings are also suggested. If a barn is to be included, its construction can be had from the following section on houses.

4. THE BUILDING OF HOUSES.

The construction for a house given in Plate 3 can be executed by fourth- or fifth-grade children. If it is necessary to use it for such a grade, different-size houses may be constructed, and some of them may have the chimneys omitted and be used to represent barns. Bogus paper, folding manila, tagboard and the various construction papers may be used.



The dotted lines are to be folded, and the solid lines represent the ones that are to be cut. The flaps are for pasting when putting the house together. The roof will be found the most difficult to paste.

This problem increases in interest, however, when it is used as a seventh- or eighth-grade project, where the classes have acquired considerable skill in the measuring, cutting and manipulation of the paper. Plate 4 shows parts of two villages constructed in the manner here suggested.

The first steps are the construction of a house such as the one in Plate 3, being careful that accurate results are obtained. If the class is advanced enough, a simple free-hand drawing of the front and end elevation should precede the construction. After the house has been constructed, the drawing of the floor plan, end elevation and front elevation should be done with the aid of a ruler. Two elevations and the floor plan are shown in Plate 3. If drawing-kits are available, they should be used here. Consult the chapter on mechanical drawing unless it is quite fresh in your mind. A house or building for the village is next decided upon by each member of the class. These may be chosen from books or magazines that are to be had, or from houses that are to be found in the vicinity of the school.

Here again it is necessary to have sketches of the elevation and of the floor plan. At this stage it is necessary to decide upon the size of the lots, otherwise the houses will not fit well into a city scheme. If the class is large, and the place for mounting the city not correspondingly large, 9"x12" will be found a convenient size.

A plan of the lot, full size, is next drawn, and the house located by means of the floor plan for the house. Then finish the plan for the lot, which will include walks, grass and shrubbery. It may include,

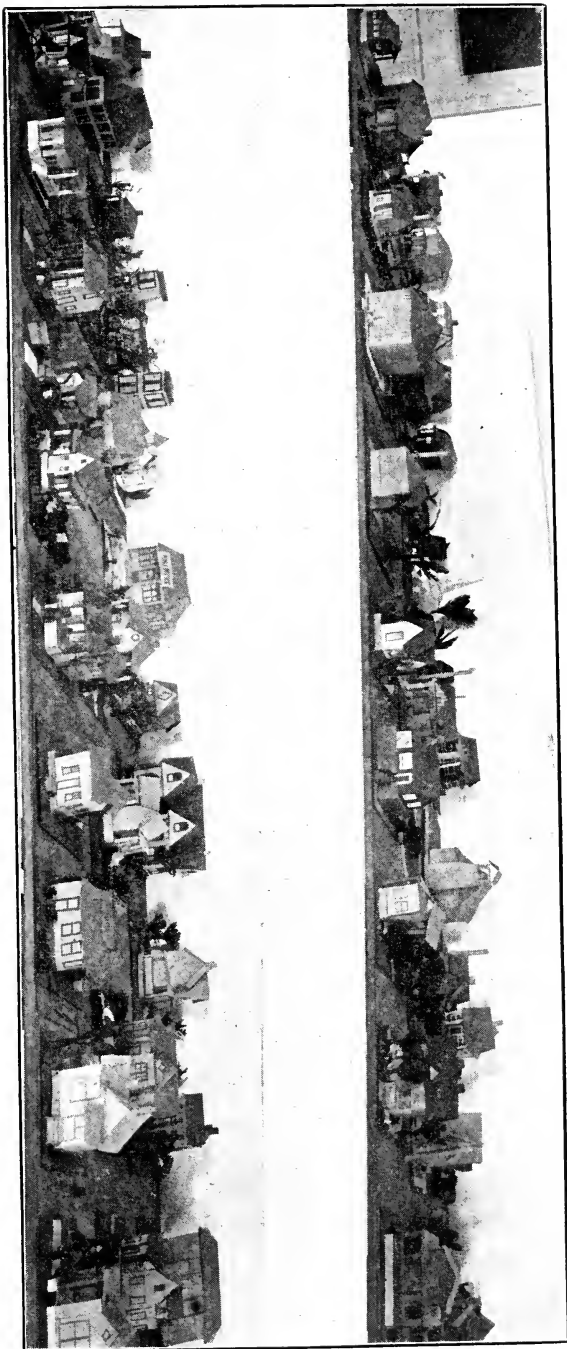


Plate 4.

in addition to this, a garden, barn, fences, garage, etc. Be sure that the house is first represented on the lot by the floor plan, and then the walks, shrubbery, etc., because, as a rule, houses are not built to accommodate shrubbery, etc., but the shrubbery, walks and other additions are made to beautify the house and make it more convenient.

A pattern is first constructed from bogus or manila paper. The main part of the house should be made from one piece, however. If necessary, single rooms or galleries may be added. The dormer and bay windows are constructed separately and pasted to the house. Foundations should be represented. Bogus paper is used to advantage as concrete, stone or stucco work. The columns for the verandas and porches may be made either square or round.

In choosing paper for the construction of the house itself, use a darker tone of the same, or another color, for the trimmings or roof. The windows and doors may be represented in several ways—by ruling lines and pasting on the paper for the casings, cutting out the windows and pasting thin paper on the inside, pasting a piece of paper on the inside on which draped curtains have been drawn in pencil or ink.

While the work is going on, an opportune time for teaching the pupils and having them become familiar with the various parts of a house is afforded. Such terms as corner-board, water-table, weather-board, entablature, cornice, frieze, architrave, rake and return of cornice, corona, fascia, post, capital, parts of the window (muntin, meeting-rails, sash, casing or trim, sill, and wash), etc., should now become a part of their vocabulary.

The house completed and the other demands of the plan executed, a complete working drawing is made. Make as many elevations as are necessary. Only one side elevation is necessary if both sides of the house are constructed alike. A in the floor plan, Plate 3, represents a door, and B windows.

This problem always carries so many good things with it that it has been found very much worth while. It reflects to a large extent the living ideals of the children, and affords us an opportunity of correcting them where they are wrong.

Many uses can be made of this problem. In addition to an ordinary village, it may be used to execute villages in connection with geography. Tropical villages can be made an interesting method of teaching history, and the tropical towns become much more real when brought to the schoolroom in miniature. The Spanish and other architecture can be taught and made a concrete rather than an abstract thing. Last, but not least, we can build Japanese villages, and represent that nation at home and at work surrounded by beauty.

III.

SPECIAL-DAY EXERCISES.

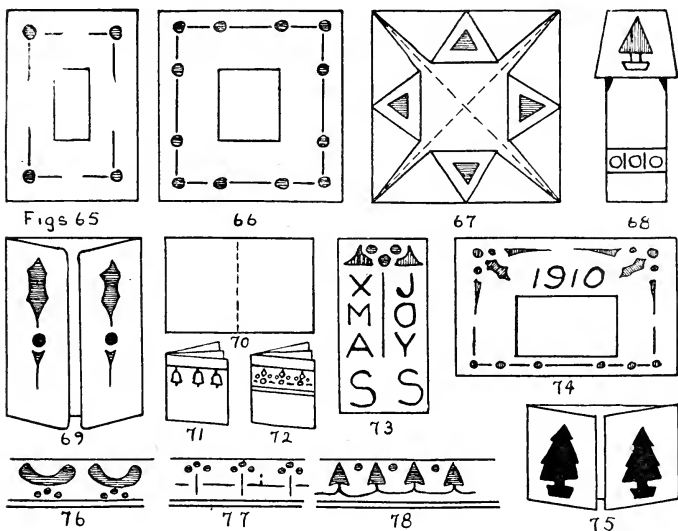
As has been suggested in the preceding chapter, there has always been a demand for special-day exercises. Of these, Christmas, St. Valentine, Washington's Birthday and Easter will be considered. Before proceeding farther with this work, get in mind the fact that you should notice from time to time how suggestions offered for one of the special days may readily be converted into material for any of the others. The progressive teacher can take advantage of this, and always have a large number of different projects if there is a need for them.

The execution of these depends on the age and ability to handle material. Crayon should be used in the lower grades, and replaced by water-colors as soon as possible. Lettering should be done, as a rule, in black. It makes a pleasing variety to have some of the work outlined in black and then filled in in color, especially where a somewhat similar card, calendar or booklet is used in several of the grades. Any kind of drawing or construction paper may be used. Bristol board can be put to many uses. Be especially careful of the lettering in all of this work. The chapter on mechanical drawing should be consulted in lettering. Good results in lettering should be demanded as low as the third grade, and surprisingly good results will be obtained in the first and second grades if a little special attention is given to it. The letters should for the most part be drawn free-hand. Avoid

long quotations or greetings in the lower grades. If there is a lack of material for the decoration of these projects, consult the chapter on designs. Envelopes, gift boxes, hanging baskets, May baskets, and candy boxes will be included in this chapter.

1. HOLIDAY SEASON.

For the decoration of these, the motifs have been taken from Christmas symbols or things associated with the holiday season.



Figures 65 and 66 are very simple calendars designed for the first two grades. The circles are holly berries, so they will be colored red. The lines may be green or black. The square and oblong forms

represent the places for the calendars. The small calendar pads, which can be obtained from any drug or novelty store, or ordered along with other materials, are pasted in place as indicated. The calendars are then complete.

Figure 67 is shown ready for a greeting. The card or frame is made from a square piece of paper. Begin by folding it in the center both ways. The folds are indicated by the dotted lines in the figure. Then fold each corner so that it comes just to the point where the dotted lines cross. The corner is then folded back again, taking the position shown in the figure. Any simple design may be used on the corners and colored or inked. The motto or greeting is lettered on a square of paper and placed inside of the square, thus covering the lines left by folding. The diameters may be ruled on the back side, and the greeting lettered on the folder itself.

This project can be used for a picture frame, valentine or Easter card. It may be varied by punching holes and tying at each corner with cord, raffia or ribbon. Cutting away the small corners or triangles makes a larger unit possible.

The bookmark in Figure 68 speaks for itself. The wider part at the top, which has the conventionalized tree, is folded over.

Figure 69 makes a very attractive folder, and can be used for any of the special-day projects, and also makes a very attractive form of invitation. Invitations are often made to use in inviting parents and friends to school exercises or programs, and afford not a little training for the children. The greeting may be written on the inside if done by

young children, and a simple decoration used on the cover. For older children using the design in Figure 69, letter the greeting on a separate piece of paper, and paste by putting a small amount of paste in one spot, just enough to keep it in place.

A little in advance of the preceding are Figures 70-72. For the cover a heavier paper is used. This is cut away and folded in the center as shown in Figure 70. The leaves are cut just a little smaller, so that the covers will project a little beyond the leaves, as they do in any book. It will be well to emphasize again that we should always notice the practical example of the article that we are constructing. The design in Figure 71 is a most simple one, and can also be worked into a border. The one in Figure 72 is more difficult to execute, and is intended for older children. The suggestions in Figures 76-78 may also be used so as to have a variety.

Figure 73 is simply a card, showing what can be done in this direction. Stress should be placed on the lettering. This card demands an envelope; in fact, all of the projects in the holiday class do. The plate, including Figures 79-89, shows three styles of envelope. The one in Figure 81 is most desirable for gift-work. The proportion should be first worked out for the finished envelope, and enough added for the flaps in order to ascertain the dimensions of the paper from which it is to be cut. After the paper is cut, draw the pencil lines indicated by the dotted lines. Cut the flaps as indicated in the same figure. The envelope folded and pasted in Figure 89 shows that the flap at the top is rather narrow. This is done so that it is more easily closed.

Figure 74 is a decorative calendar, differing from Figures 65 and 66 in the design and proportion only. Children who attempt this and cannot draw well may cut a holly leaf from paper and mark around it in order to get all of the parts alike. This calendar is supported in the same way as the different projects using the construction given in Figure 25.

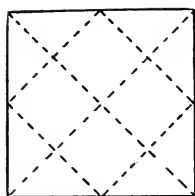
The folder in Figure 75 is similar to Figure 69. The Christmas tree may be used in many other decorative ways. Figures 76-78 show simple borders.

Many additional projects could be suggested, but the ones given are more than sufficient to give material for a working basis. Only remember not to try to do detailed and elaborated projects.

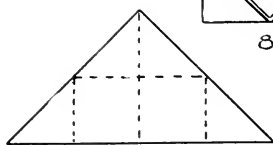
2. ENVELOPES.

Figures 79-82 show the different steps in the execution of a very simple and effective envelope. A square piece of paper is cut and folded as indicated in Figure 79. Then Figure 80 shows it folded a single time, making two thicknesses of paper; Figure 81 shows that each lower corner is folded towards the center; and Figure 82 with the upper corner or triangle folded down, making the completed envelope. The envelope is then partially unfolded and pasted. The last or upper flap in Figure 82 is not pasted unless it is to be sealed, and even then, if using it for gift-work, it is more effective and satisfactory if inclosed in another envelope. This envelope is especially desirable for small children who can do no measuring at all.

No dimensions are given for the report-card envelope shown completed in Figure 85, since the



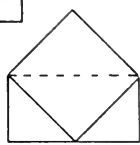
Figs 79



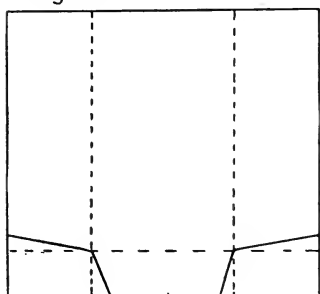
80



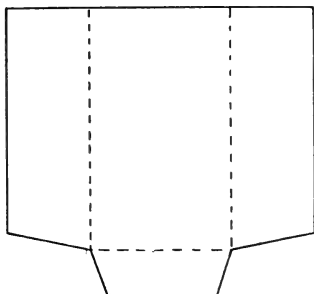
82



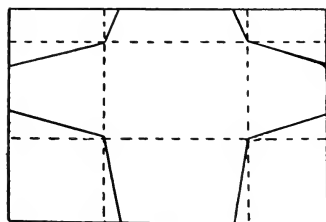
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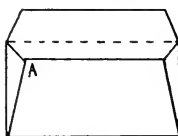
83



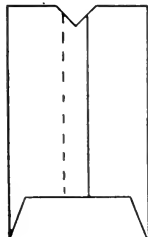
84



86



87



85

sizes vary. In order to determine the size of paper from which it is to be made, take for the size of the large oblong in Figure 83 slightly more than the size of the card, in both length and width. To get the width of the oblongs on either side, add $\frac{3}{4}$ " to one-half of the width of the large one. The width of the flap on the lower part of the envelope is to be cut in

proportion to the size. Figure 84 shows Figure 83 after cutting on the solid lines, and is ready for pasting. After pasting cut a niche at the top of the envelope as shown in Figure 85. This aids in withdrawing the card from the envelope.

Figures 86 and 87 need little explanation, the size of the paper being determined in the same manner as in the paper for Figure 85. Notice that the flap below the large oblong is much wider than the one above it. This is more appropriate for the gift envelope, since the upper one is inserted in the envelope instead of pasting it. If it is to be pasted, the flaps may be of the same width. Be careful to have the corners of the lower flaps to coincide with the edges of the flaps on the ends.

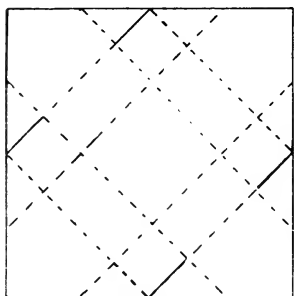
These envelopes are suitable for all of the gift-work.

3. BOXES.

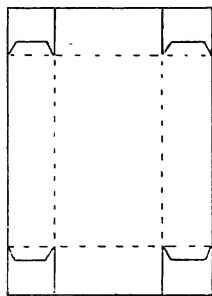
The boxes in Figures 88-92 are typical of what can be done in the way of making boxes. Figure 88 is one of the simplest that can be executed. A square of the desired size, and three dots made on each edge, dividing the edge into four equal spaces, are first executed. Then draw lines for folding, indicated in Figure 88 by the dotted lines. Fold and cut solid lines as indicated. In folding it will be seen that the four corners make a suitable top, or cover. Paste where necessary to hold the sides together.

A plain open box is shown in Figure 89. Cut on the solid lines and paste the flaps on the inside. This box may be used with or without a cover. The

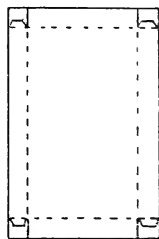
cover is made in the same manner. The sides are not to be more than 1" in height. It is constructed (Figure 90) the same as Figure 89.



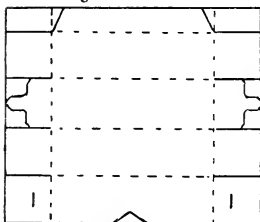
Figs 88



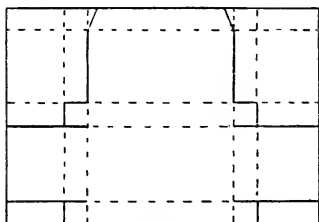
89



90



91



92

The gift-boxes in Figures 91 and 92 can be varied both in design and construction, especially Figure 92, which may be decorated by repeating some unit, using a block print. Consult the chapter on design which explains about the cutting of the block as well as designing the unit.

4. ST. VALENTINE.

No large number of motifs are available, but much can be done with those suggested in Figures 93-107.

Avoid the gaudy colors except for very young children. A heart will not appeal to them unless it really is red.

Figure 93 may be made from one or two pieces of paper. Fold a piece of paper in the center, and cut the desired shape so that both halves of it will be uniform. For the lower grades cut a large heart and a small one, pasting the white one on the red one. The message or greeting is written on the white one. If one heart is used, draw a small heart on the large one, and the message will be in the same position.

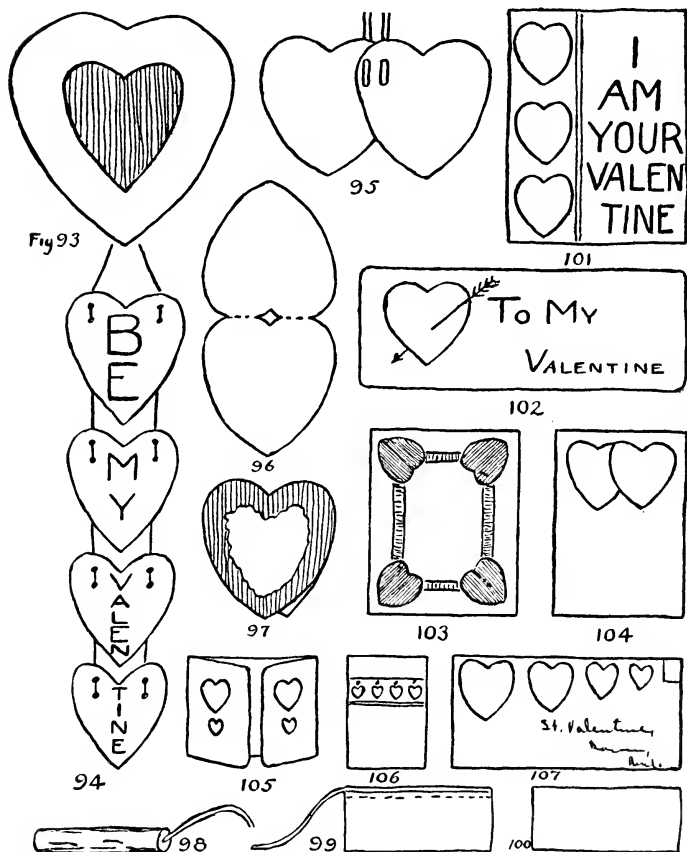
The construction for Figure 94 is simplest if a large heart is cut and parallel lines drawn on it, making smaller hearts so that they may be cut and drawn in turn, thus having the whole set conforming to the same shape. The large one drawn, cut for the second one; draw the second, and cut for the third, etc. Punch holes and secure by means of cord, or cut slits, and use ribbon. Lettering is done free-hand. Remember the suggestions offered in the preceding pages.

Figure 95 is made in two ways. The two hearts may be cut separately and then secured with ribbon or cord, with a bow at the end for hanging. To make it more difficult, but stronger, draw it so as to be cut in one piece.

Figure 97 is designed to have a message written between the two covers and a greeting on the outside cover. Figure 96 shows the construction for Figure 97. Color is applied around the outer edge without guide lines, which gives an irregular outline, dividing the white from the colored part of the valentine.

The fire-cracker valentine (Figure 98) will be of great interest to children in any of the elementary

grades. Use red paper for Figure 100. This is to form the fire-cracker proper. Roll it on a pencil or some round object, and paste. Then slip out the pencil, and you have a red tube. Figure 99 is for the message, and has a piece of cord pasted along



one edge. Write the message and roll around the cord, and slip into the tube. It will unroll enough to keep it in place. The part of the cord left hanging out forms the fuse, and is used to withdraw the message. This makes it equal in appearance to a real fire-cracker and far less harmful.

Figures 101-104 are cards, and show different methods of decoration.

The folder in Figure 105 is intended to have the message printed on a card and mounted under the covers of the folder the same as in the Christmas folders, Figures 69 and 75.

Figure 106 illustrates what may be done in the way of booklets. The envelope in Figure 107 is but one of the possible decorations. The different-sized hearts may be drawn in the same manner as suggested in Figure 94.

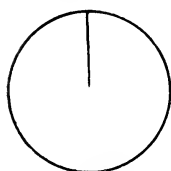
Avoid the use of darts or arrows as much as you can, and especially the cutting of them attached to the hearts, for that makes a poor construction, since the darts are so weak that they tear off easily, thus making a valentine shortlived.

5. WASHINGTON'S BIRTHDAY.

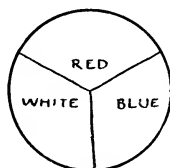
Programs are often planned at this season that require some of the classes to parade or march, and banners, shields, badges, etc., are needed.

A very effective badge is made like Figure 109. Cut three circles of the same size (Figure 108), one of each, red, white and blue. If paper in the three colors is not available, drawing paper may be colored. After the circles are cut, cut a line from the center to

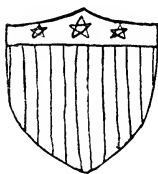
the circumference, as shown in the figure. The circles are then slipped within each other and turned, so as to adjust themselves, showing equal parts of red, white and blue (Figure 109). Paste so they will remain in place.



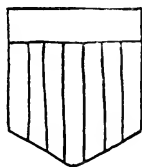
Figs 108



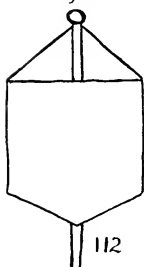
109



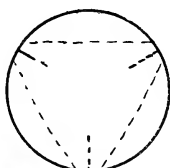
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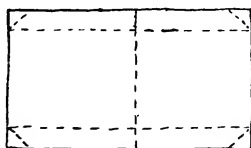
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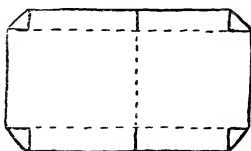
112



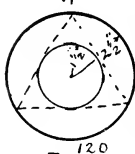
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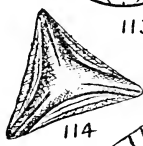
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117



120



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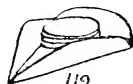
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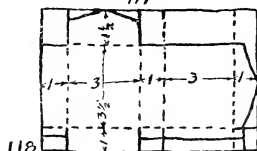
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122



119



118

For the shields (Figures 110 and 111) use drawing paper. A half sheet, 6"x9", is a good size. To get a pattern, fold paper in the center lengthwise, and cut free-hand for the form of the shield, and trace on the drawing paper. Measure down a proportionate dis-

tance from the top for the blue field. The stripes are then measured and ruled. The stars are cut and traced on the blue field. The shield is now ready for color. Crayon or water-colors may be used. For very young children the stars may be cut from colored paper and pasted in place.

If banners for marching are desired, attach same to a pole as shown in Figure 112.

A simple hat is shown in Figure 114. The construction (Figure 113) is quite simple, being only a circular piece of paper folded in six places. Draw three radii, and fold nearly half their length, beginning at the circumference. The other three folds indicated in the figure complete the hat.

A good size for a tent (Figure 115) is 6"x9". Begin the construction by folding the dotted lines as indicated in Figure 116. Cut ends of the folds in the center as indicated in Figure 117. The tent is then set up and pasted at the gables.

The soldier's knapsack in Figure 118 is dimensioned; not in inches necessarily, but in terms of a unit. It is folded lengthwise and pasted. The flap with the $1\frac{1}{2}$ is the one used for closing. Then a piece of paper is pasted with an end on each side to act as a shoulder-strap for carrying.

Figure 119 shows a more elaborate hat than the one in Figure 114. The brim is shown in Figure 120. The dimensions are given on the hat. The central part is cut out and the crown shown in Figure 121 is cut and put in place. The band in Figure 122 is pasted around the crown. If the folds on the dotted lines in Figure 120 were carefully made, the hat is now complete.

Flags may be made of cheesecloth, and colored by using water-colors.

6. EASTER SEASON.

If the previous parts of this chapter have not been worked out, it will be well to at least read them before attempting the Easter problem.

To make the card in Figure 123, cut a pattern and mark around it in order to cut the eggshaped pieces of drawing paper, or whatever kind of paper is being used. It may be finished by simply coloring and securing by means of a cord or ribbon. The drawing on the card in Figure 123 may be executed if the pupils can draw the figures. A drawing in outline is easier and perhaps better.

This card may have the greeting only if that is sufficient. Instead of having two separate pieces for the upper part, let the pattern overlap the one already drawn on the paper, and then cut out the two in one piece.

Figure 124 is a modification of Figure 123. Cut a pattern of the largest egg and mark around it. Cutting it down by means of a line parallel with the edge, use it to trace the second egg, etc. Secure in the same manner as Figure 123.

Figure 125 is a folder with a suggestion of what may be done in designing simple bands or borders.

The executions shown in Figures 126 and 127 are for cards, or place cards. The shading may be omitted and the drawing outlined in black and then covered. In designing them, avoid having small parts that project out from the large parts like the ears of the rabbit. When made long and small they are weak and tear off easily.

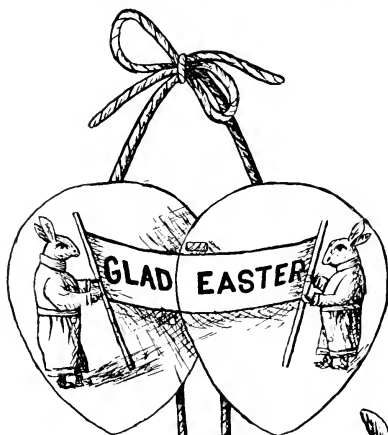


Fig 123

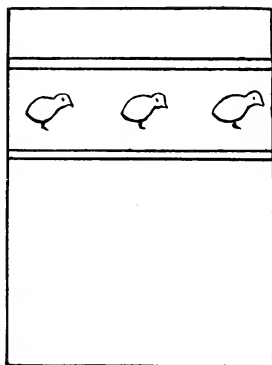


Fig 125



Fig 126



Fig 127

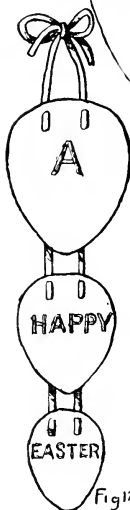


Fig 124

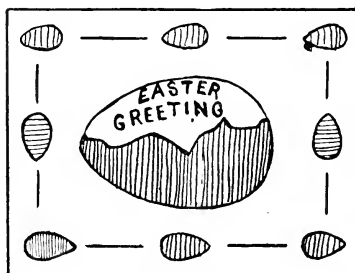


Fig 128

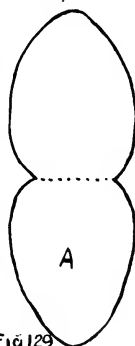


Fig 129

Figure 128 is intended for a greeting-card, but may also be used for the decoration of a folder or booklet.

The cover is not shown in Figure 129, but it may be left plain and colored, or it can be decorated. If yellow is used, a light wash could be applied, and as soon as the card is dry make the edges a darker yellow with an irregular line dividing the two yellows like the valentine in Figure 97. The message or greeting is written on the inside of the cover, or on part marked "A" in Figure 129.

As was suggested in the beginning of this part of the chapter, which treats the Easter season, many of the projects used for preceding holidays may be converted into simple Easter cards, folios and booklets.

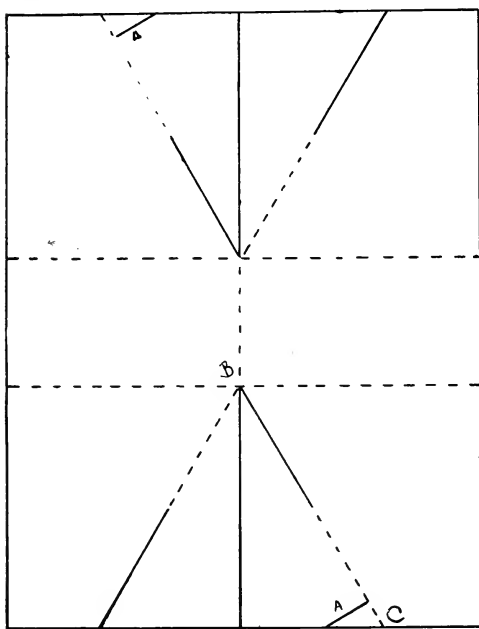
7. HANGING, GIFT AND MAY BASKETS.

The first of these, shown completed in Figure 132, may be used in various ways. It is especially desirable as a May or hanging basket. Drawing paper may be used and colored if colored baskets are wanted and no colored paper is to be had.

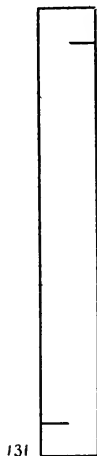
Cut an oblong of the desired size three times the size of Figure 130, which makes a good-sized basket. Draw the necessary lines on the paper for folding and cutting, and proceed with cutting and folding. The lines like BC are drawn in pencil and cut half-way, as shown in the drawing, by the solid lines. Interlace the triangles at the sides of the basket, and it is ready for the handle. The handle is shown in Figure 131, and, after cutting half-way across near each end, it is attached to the basket, interlacing at the small cuts labeled "A."

This basket may be made larger or smaller than has been suggested. It affords a simple construction, involving no paste or sewing of any kind.

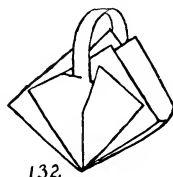
The basket shown in Figure 134 is similarly constructed. Drawing paper, some paper that will take color, is needed.



Figs 130



131



132

Draw a line across the center of the sheet. The line is indicated by A in Figure 133. Next find the center at the end of the paper indicated by C and make dots. Then measure down from the corners distances equal to half the distance across the end.

These dots are indicated by B and D. Draw lines BC and BD, and angle BCD will be a right angle. Then draw the lines at the ends of the line A, making the angles like DEF right angles. The circles for the center of the flowers are next drawn, making them as large as possible in order that they will be strong when interlaced. Cut on the

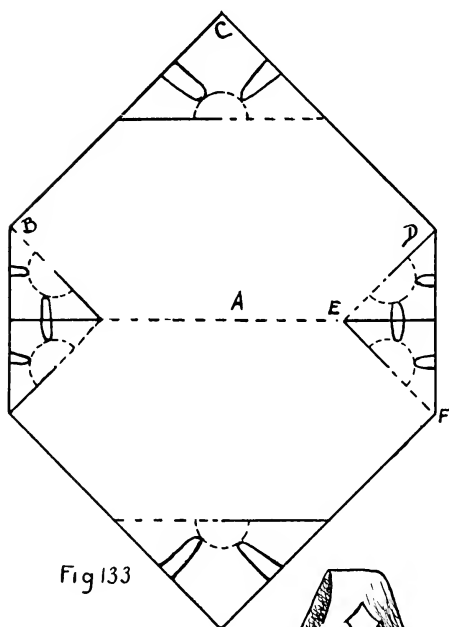


Fig 133

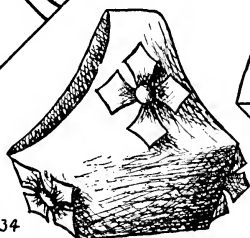


Fig 134

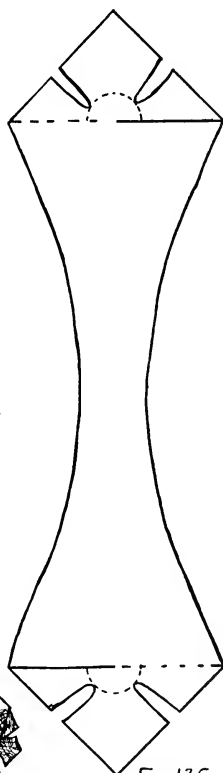


Fig 135

solid lines of the triangles, and also cut out the spaces between the petals. Color the petals yellow and the centers brown. Interlace the sides of the basket and the ends of Figure 135 with the sides of the basket.

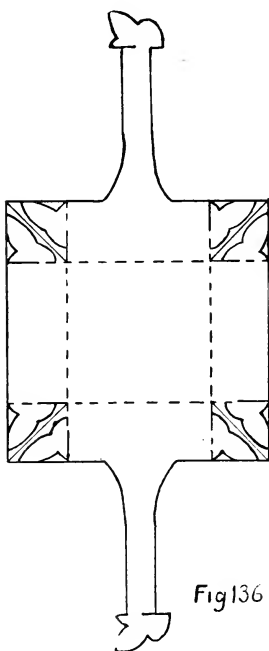


Fig 136

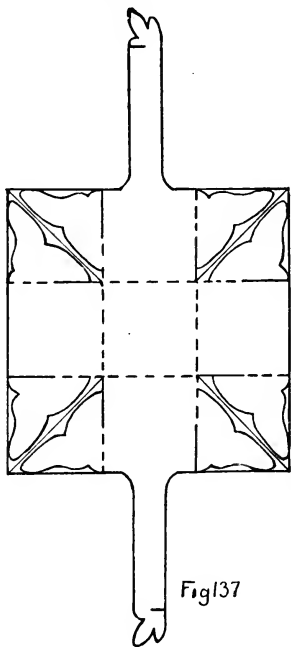


Fig 137

The baskets in Figures 136 and 137 are similar in construction. The one in Figure 137 is made up of nine squares and has a handle in addition. Draw diagonals on the corner squares, and draw in a half of a butterfly in each half of the square as has been done in the figure. The dotted lines are folded and cut on the sides of the corner squares so that they will interlace in order to put the basket together.

The ends of the handle interlace, forming a handle with a butterfly at the top. Also the interlacing makes a butterfly at each corner of the basket. The butterflies may be colored in water-colors or crayon. A good effect may be obtained by dotting the wings with black after coloring. The basket in Figure 136 is the same, except that the square in the center determining the size of the basket is much larger than the ones at the corners.

IV.

MISCELLANEOUS PAPER SLOYD.

Special occasions always arise that demand certain projects in paper and cardboard that are not mentioned in the other chapters of this book, and usually we have some children who can carry out their projects more quickly than can their classmates. This affords material for extra problems.

Paste is usually purchased in large quantities, but sometimes it becomes necessary for us to make our own supply. A good paste is made by taking one cup of flour and one teaspoonful of dissolved alum. Mix the flour with a little cold water, being sure to get out all of the lumps. Add four cups of hot water and boil for three minutes, stirring constantly. Add a little essence of peppermint when done. This gives a flavor and prevents souring quickly.

Figure 138 shows a 6" square folded on the line AB, drawn $\frac{1}{2}$ " from the top. Dots are made on this and on the folded edge at intervals of $\frac{1}{2}$ ", and lines drawn connecting the dots that are opposite each other. Cut on the lines, taking care that you stop just as you get to the line AB.

To make a lantern of this, unfold and paste the sides together, overlapping each other $\frac{1}{2}$ ". A dark strip of paper $\frac{1}{2}$ " wide pasted around the top, and one around the bottom, improve the appearance. Paste a narrow strip of paper to one end for hanging (the same as the strip used for a handle in Figure 146).

Figure 139 is a sled. To find the width of the paper, add to the width of the sled twice its height. After the paper is cut to size draw a pencil line in the center, represented by the light solid line. Set the compass on this line in drawing the semi-circumferences. The drawing shows the remainder of the construction in such a way that it is not necessary to describe it farther.

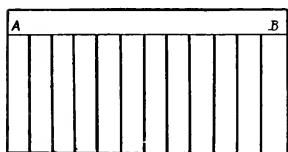


Fig 138

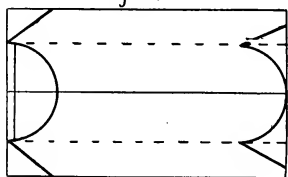


Fig 139

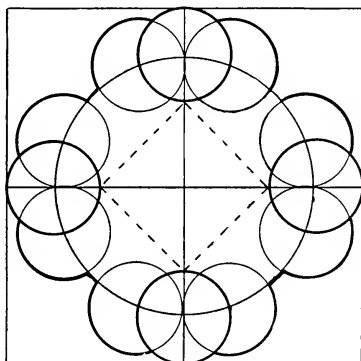


Fig 142

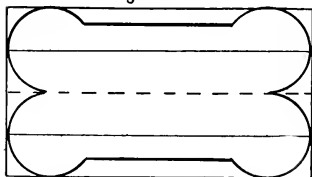


Fig 140

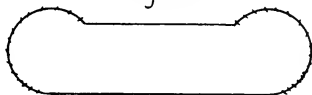


Fig 141

Figure 140 (the canoe) is of a suitable size if made from a piece of paper 3"x5". Construct by folding in the center lengthwise. Then draw pencil lines, represented by light solid lines in the figure, in the center of each half. Using these lines as centers, draw the four circles necessary. Draw heavy lines from circle to circle, then cut on all of the heavy

solid lines. Fold on the dotted line in center and sew ends together as shown in Figure 141. Raffia or cord may be used in sewing. Streak the sides of the canoe with crayon so as to make it resemble birch-bark.

Figure 142 is an Easter basket. Cut a square of the desired size, using the actual measurements in Figure 142 as a unit, and enlarge as many times as you choose. For all of the dimensions enlarge in a like manner.

Draw lines across the centers each way. With the point of crossing as a center, draw the large circle. Then taking the four points where the large circle cuts the diameters as centers, draw the four small circles that are drawn in heavy solid lines, meaning that they are to be cut out. Be sure that the radius of the small circle is just the distance from the center to the edge of the piece of paper. Next, with the eight points where the small circles cut the large one as centers, draw circles using the same radius. Cut out the four small circles first drawn, the parts of each of the small circles shown in heavy solid lines, and the parts of the large circle joining the small circles. Draw the square, represented by the dotted lines in the figure. Tie the basket at the corners, add a handle by pasting on the inside, and the basket is complete.

Figure 143 shows a tray constructed from a square. Cut on the solid lines, fold on the dotted lines, punch holes, tie at the corners, and the tray is finished. A simple design may be painted on the sides if desired. Figure 146 is a sketch of the finished pail constructed from Figures 144-145. The circular piece is cut first, and then, estimating the circumference from

this, we plan Figure 144. The distance from the line A to the dotted line is the circumference. The distance from the dotted line to the other edge is $\frac{1}{2}$ ", which is allowed for lapping in pasting. The small oblongs at the lower side are bent on the dotted lines before pasting. After pasting the sides paste one of the circular pieces inside the pail and one on the bottom outside. These were the circles, one of which is represented in Figure 145. Paste a strip on the inside for the handle.

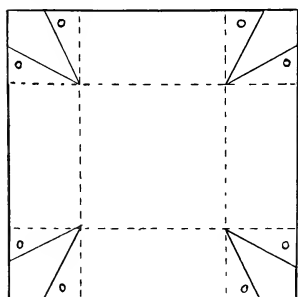


Fig 143

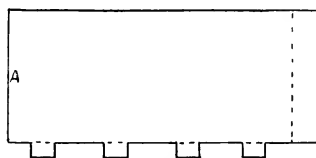


Fig 144

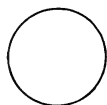


Fig 145

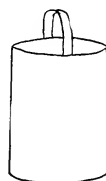


Fig 146

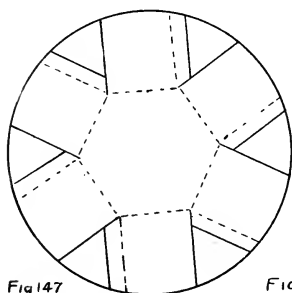


Fig 147

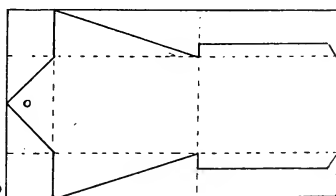


Fig 148

This problem may be varied, and executed as a tub, or as a watering-can by the addition of a spout.

Figure 147 gives the construction for a hexagonal tray from a circular piece of paper or cardboard.

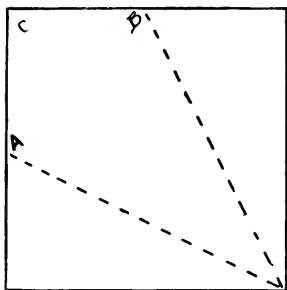


Fig 149

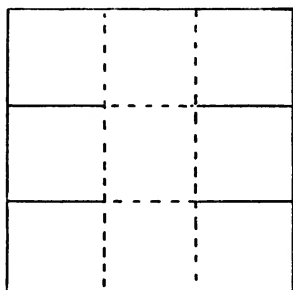


Fig 150

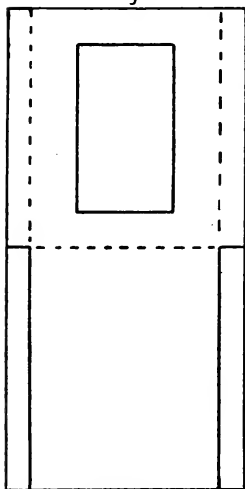


Fig 151

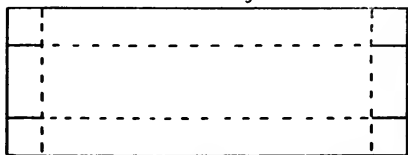


Fig 152

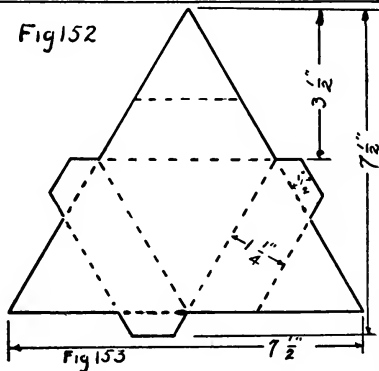


Fig 153

Fold on the dotted lines, cut on the solid ones, and then paste the flaps to the inside of the sides, which completes the tray.

Figure 148 is the construction for a wall pocket, which should be enlarged at least six times in order that it may be of service. After cutting the paper, draw the lines for both cutting and folding before you attempt either. Paste the flaps on the inside of the pocket.

Figure 149 may be used for either a cornucopia or scissors case.

For a cornucopia make it much larger; 6" square is a good size. Points A and B are the centers of the sides. Fold on the dotted lines, and paste where they overlap. Punch a hole for hanging at C.

The scissors case is made in the same way, except that the hole at C is omitted, and a line drawn from A to B, on which the corner is folded.

Figure 150 is merely the construction for the box. It is given, because, frequently, there is a demand for seed boxes in connection with the work in school-gardening, etc. A handle may be added, converting it into a basket.

Figure 151 is a simple picture frame. Fold on the dotted line and cut on the solid ones. The central oblong in the upper half will fall out, and the picture is mounted back of it. Fold up the lower oblong and paste the flaps. If it is not to be hung up, use the device in Figure 25 to make it stand up.

Figure 152 is a pencil tray constructed just like a box. Use a piece of material $3\frac{1}{2}$ " wide and 10" long, making the sides $\frac{3}{4}$ " high.

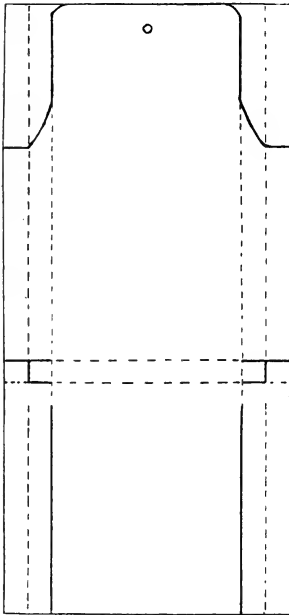


Fig 154

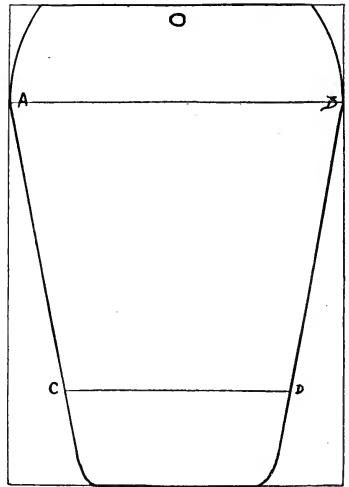


Fig 155

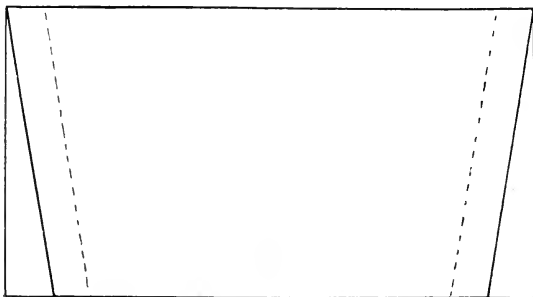


Fig 156

Figure 153 is a working drawing for a triangular box with cover. It may be used for a gift, candy or trinket box.

Dimensions are given with the construction, so no further explanation is necessary. This is a good model for the boy who always gets thru with his work in advance of his classmates.

Figure 154 gives the construction for a letter rack. Use a piece of material 6"x13". The lines on each side are $\frac{1}{2}$ " apart. The distance from the lower edge to the dotted line is $4\frac{1}{2}$ ", and from there to the next dotted line $\frac{1}{2}$ ", which is the same as the space between the lines on the sides.

Figures 155 and 156 give the parts for a whisk-broom holder. A good-size holder is made by cutting material twice the size of the figures. Figure 156 is cut and folded, and then pasted on Figure 155 with the flap on the back. The upper edge comes at AB, which causes the lower edge to fall on CD. AB and CD are pencil and not cut lines.

Figure 159 is a sketch of a completed Dutch windmill. Figure 157 is cut, folded and pasted as indicated. The windows are to be turned back slightly, so as to assume an open position. One of them may be cut lower down and made slightly larger, so as to serve the purpose of a door. Figure 157 has a light solid line showing how it was drawn. Use the heavy solid line for cutting. Attach by means of a pin.

Figure 160 is a pocketbook to be constructed from leatherette lined with construction paper. The parts at the ends of the oblong A are folded in and then

pasted to the oblong to the right, when A is folded over. Repeat the operation on oblong B. A good finished size is $2\frac{1}{2}'' \times 3\frac{3}{4}''$.

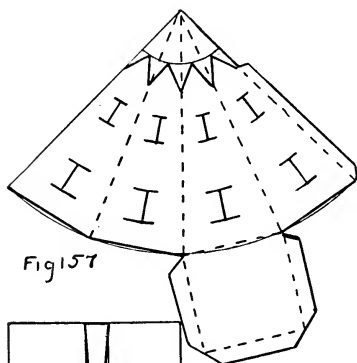


Fig 157

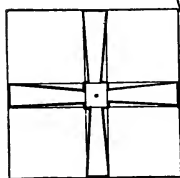


Fig 158

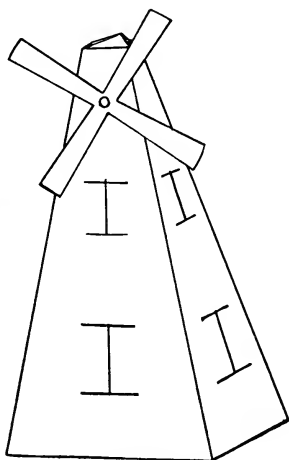


Fig 159

Figure 161 is a cardcase and constructed in a manner similar to Figure 160. A good size for this case is $3'' \times 4\frac{1}{4}''$.

Figure 162 is a billbook and pocketbook combined. A slit is cut in the outside, into which the end of the flap is put.

Many other constructions from paper and cardboard could be given, but, with those given in this and preceding chapters, one is afforded sufficient material for a working basis, and should be able to work out any problem on this order that is applicable to schoolroom use.

Election time suggests horns, band-wagons, pen-
nants, arches, grand-stands, etc.

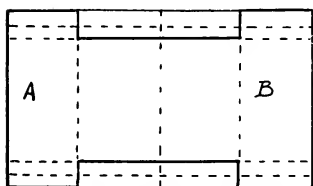


Fig 160

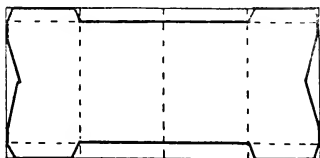


Fig 161

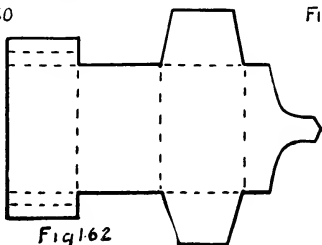


Fig 162

Vacation suggests canoes, sailboats, tents, trolleys,
railway cars, parks, etc.

Hiawatha suggests bows, arrows, quiver, tent,
cradle, beads, belts, moccasins, etc.

Transportation suggests carts, wagons, railway
cars, ferryboats, freighters, etc.]

V.

CORD AND STRING WORK.

A boy is always made happy when he becomes the proud possessor of a piece of cord or string. He puts it to many and various uses. There is some fascination about it which causes it to remain very dear to him.

If the children have been happy to own cord and bits of string which they used in making various things without guidance or instruction, how much happier they are when these become part of their schoolwork.

They should be taught the value of making things correctly and to see the advantage of knots properly tied over the ones that will not hold. The eye is trained along with the hand. It also teaches spacing and measurement.

The children will also be interested in knowing that knots were used as a safeguard against intruders before locks and padlocks were invented. The ancients have used them as a language thru which to send messages, and Japan at the present time is said to have a code of etiquette practiced thru knots, thus conveying messages of congratulation and sympathy.

The cheapness of the material is also favorable to its introduction. The children can bring cord and twine from their various homes if necessary. These may be used as they are brought, or, better, dye them, thus giving variety and doing away with the

dingy, dirty appearance that has resulted from the uses to which the cords previously have been put.

Of the commercial materials Macramé cord is probably the most desirable, since it can be had in so many shades and colors. Seine cord is more economical, since it comes in the white and can be dyed readily. If doubtful about the size in ordering, have samples sent of the different sizes, and order from the samples. Cords numbered from 12 to 16 are of the correct size, with No. 4 used for binding.

Some device for holding the end of the cord while the children are knotting or chain-stitching is necessary. A good one is made by fastening brass cup-hooks on the walls, and then the cords may be hooked over these while working.

1. WATCHCHAINS.

These problems are intended to teach knotting; and the chain-stitch, which is very similar to crocheting, except that the fingers are used instead of a hook, will be taken up first.

The over-hand knot is very simple, and is illustrated in Figure 163. Begin by making a circle with the cord and drawing the end thru. If a long string is being knotted, it is best to double the cord so as to find the center, and knot toward each end. This makes a shorter end to pass thru the loop, saving time and being less cumbersome. The knotted cord will resemble Figure 164.

An over-hand knot using two cords is knotted in the same manner as Figure 163, where only one cord is used. Two colors are represented in the knotting

executed in Figure 165. If only one color is used, a loop can be left at one end, affording ready means of attaching the chain to a watch or something else on which it is to be used.

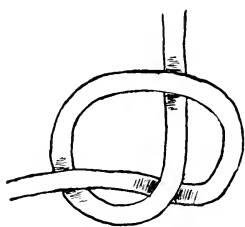


Fig 163

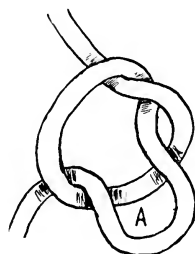


Fig 166



Fig 164



Fig 165



Fig 167

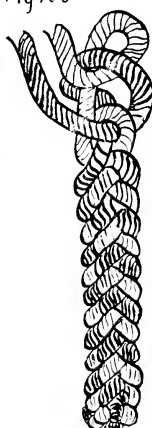


Fig 168

The beginning of the chain-stitch is shown in Figure 166. A circle is made at one end of the cord in the same manner as the one for the over-hand knot; but, instead of passing the end thru, the cord is doubled into a loop and the loop passed thru. This

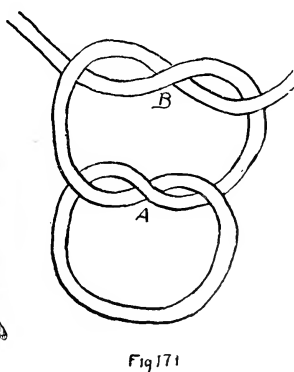
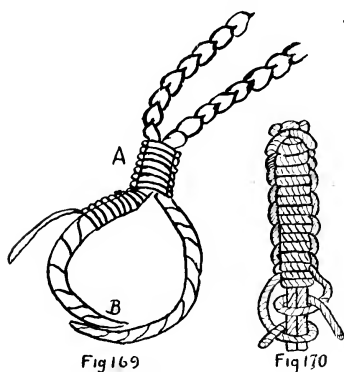
loop is at A in the figure. To continue, loop the end, again passing it thru loop A, etc., as shown in Figure 167. When the chain is long enough, it is made secure by passing the end thru the last loop and drawing it tight.

Figure 168 shows a chain-stitch of two cords using two colors. First one string is pulled thru for the new loop, and then the other. It can be seen from Figure 168 that this forms a three-sided cord.

2. GUARD FOR SCISSORS.

Several yards of cord are used for this guard. Leave about 5" of the end when you begin chaining, and stop when you get to within 5" of the other end. This is to be double, and the 5" ends are fastened together as shown in Figure 169.

A in the figure has a blanket-stitch on either side, covering the two cords, beginning where the chaining stops. This covering is shown in detail in Figure 170. If any difficulty is experienced with the



blanket-stitch, refer to the chapter on Burlap, where it is given in detail (Figure 180). Cover in this manner for $\frac{1}{2}$ ", then cut the ends to the desired length and shape as indicated at B, and sew together before covering with a single blanket-stitch as represented. The end is secured by drawing it under the stitches and cutting off closely. The scissors are then looped to this. It is assumed that this looping will be understood; if not, it can be learned from the making of the bag farther over in this chapter.

This exercise may be elaborated upon by chaining reins such as the children use in playing with each other.

3. SQUARE KNOT.

Some knot that will not slip is necessary with cordwork. The square knot, also called the "hard knot," is in common use (Figure 171).

An end of the cord is taken between the thumb and forefinger of each hand, and crossed and passed thru at A. Change ends of the cords, cross and pass thru as at B. Drawing the ends tight, the knot becomes secure and will remain so.

4. A PORTIERE.

This is intended for a portiere to be used in furnishing the doll-house, but can be made large enough for use in the home if very heavy cord is used.

The cords are placed over a pole or rod of some kind, as shown in Figure 172, to keep them even while weaving. The over-hand knot (Figure 163)

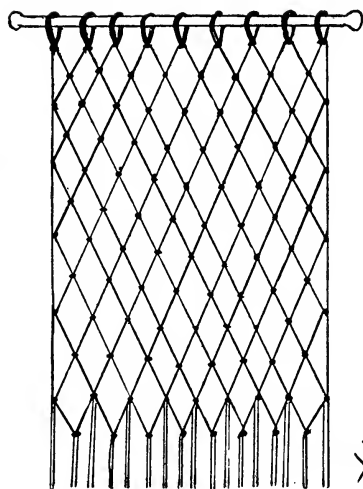


Fig 172

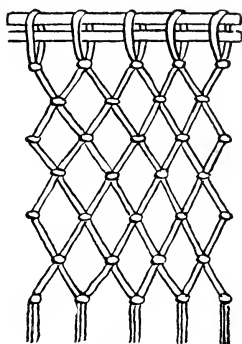


Fig 173



Fig 174



Fig 175

is used for this. Begin by knotting across just as they are hanging on the rod. The second time across omit the first cord, and knot the second cord to the first cord of the second knot, and cross, knotting in that manner. On the third time across the same cords will be knotted that were knotted the first time across.

When the portiere is long enough, cut the ends to an even length. These ends may be frayed out to form tassels, or two or three over-hand knots can be made in each cord of the knot.

5. A SMALL BAG.

The over-hand knot is again used in the bag, of which a part is shown in Figure 173. Instead of a pole around which the cords are hung, use two cords,

so that they will form drawstrings. To do this, each is doubled in the center, and one is placed with the ends to the right, and the other with the ends to the left, and the ends knotted. That makes two cords, over which the cords for the sides are hung as shown in Figure 173. Proceed the same as in Figure 172, except that you knot all of the way around instead of just across. When the bag is of the desired depth the bottom is formed by knotting the cords from the opposite sides together.

6. THE DOUBLE SAILOR'S KNOT.

The double sailor's knot makes a more effective bag, but is more difficult until the construction is memorized. A careful study of Figures 174 and 175 will teach you this knot in a few minutes. It is then used for a bag similar to the one in Figure 173, except that braids are made of No. 4 cord, to be used as drawstrings.

7. WHIPS.

Several styles of whips are possible.

Take a piece of cord slightly longer than twice the length of both handle and lash. Finding the center, tie another cord of the same length around it at the place it is doubled, using the first step (A) in Figure 171, and then with these two ends double blanket-stitch around the cord, which has been doubled as first shown in Figure 170, until you have covered the foundation to a length long enough for the handle. Then tie two hard knots, using a foundation cord and one of the blanket-stitch cords for each knot.

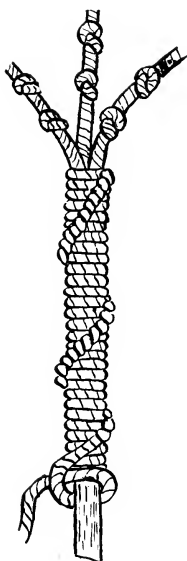


Fig 176

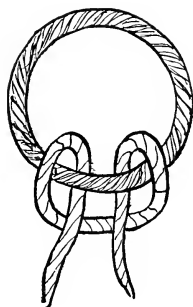


Fig 177

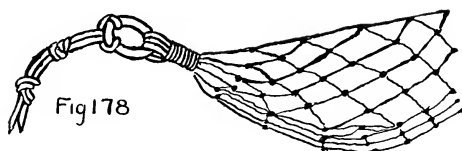


Fig 178

The lash is then formed by cutting off the ends of the blanket-stitch cords close to the knot, and knotting the other two cords at intervals completes the whip.

To make a stronger whip, use a heavy reed for the foundation (a twig or stick may be substituted for the reed). Cut niches at the end, to which three cords are secured by wrapping with fine cord. One of these cords must be quite long, with the long end

extending downward in the direction of the handle. After the fine cord has been secured begin blanket-stitching and covering the handle as shown in Figure 176. The appearance of the corkscrew is obtained by slipping the position of the loop around each time, making a revolution for each fifteen loops. The cord is fastened to the end of the handle by driving in a tack or brad. Finish the lashes by knotting each of them at intervals.

9. A HAMMOCK.

Two embroidery rings 1" in diameter, six pieces of heavy cord $1\frac{1}{2}$ yards in length, and two pieces of fine cord are necessary. Loop the heavy cords in the center to one of the rings, using the loop shown in Figure 177. Two inches down from the ring begin knotting the same as was done the second time across in the portiere—*i. e.*, omitting the first cord, and knotting by twos, leaving one on each side that is not knotted. Then knot across the second time, beginning with the outside cord, forming meshes $\frac{3}{4}$ " in length. Judgment must be exercised in determining how far towards the other end one shall knot. The other ring is attached by knotting the ends of the cord to it after the last knots have been tied. Use a slipknot for this. It is made by passing the end thru the ring and tying an over-hand knot over the cord with this end. It is now apparent that the second end of the hammock should be like the end first knotted, in that the last row of knots is to be 2" from the ring, and that the outside cords at the last row of knots are not knotted.

The small cords are for binding the ends. Bind by placing one end thru the ring for about 1", and, holding this ring in the left hand, continue with the cord along on the hammock for 1", and then return to the ring, thus forming a loop 1" in length. Now begin wrapping or winding around the hammock and this loop as close to the ring as possible. After wrapping for $\frac{1}{2}$ " slip the end of the cord thru the loop which projects beyond the wrapping. By pulling on the end that is hanging thru the ring the second end is drawn under the winding. Cut the ends off close to the binding and after repeating this on the other end the hammock is complete.

Other problems will suggest themselves, and can be readily worked out. A practical example of this is the making of the small nets that are used on basketball goals.

VI.

BURLAP WORK.

Burlap is an inexpensive material and easily provided, being what is ordinarily termed "bagging" or "sacking." It is manufactured from jute, which is described in the chapter on weaving. Burlap takes dye or color readily. The dye does not run, so that it is possible to put on decorations after a piece of work is completed, tho that is not desirable in cross-stitch work; *i. e.*, the decoration with dye in conjunction with the cross-stitching.

This sewing is coarse enough to prevent the children from strain or injury to their eyes, and the stitches that are learned and practiced here will be a great aid later when the pupil takes up fine sewing. Raffia and jute cord are the most inexpensive materials for cross-stitch decoration and are quite satisfactory. Poseidon cotton and Germantown wool, since they are materials of a better quality, make the work look slightly more effective.

Design and color are afforded most opportunities here. A pattern is suggested for each piece. But in class try to have each pupil get a different pattern. The mat-weaving is used to advantage in planning patterns for the decoration.

1. A MAT.

The first problem will be the making of a mat in which the natural burlap is used. This may be either

square or oblong (Figure 179), with a fringe on each of the four sides. To form the fringe pull out several of the threads on each side. Then, if the piece is an oblong, place your design beside it, and pull out threads of the burlap and sew in colored jute threads to take the place of the ones that have been pulled out. In case of a square the same plan may be executed, which means colored threads are introduced parallel with each of the four sides.

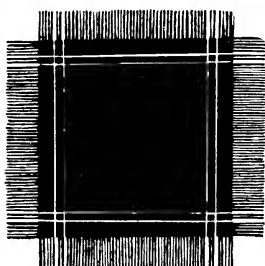


Fig 179

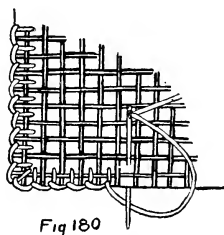


Fig 180



Fig 181

2. A NAPKIN RING.

Cross-ruled paper is used in designing the pattern for the napkin ring. If no cross-ruled paper is at hand, a valuable ruling practice is afforded by having each pupil rule his own.

Cut a strip of burlap $1\frac{3}{4}$ " wide and 9" in length. One end is cut to a point as shown in Figure 181, and the other end is left square.

Something must first be done to prevent the edges from fraying out. Use a blanket-stitch (Figure 180), but do not sew in too far from the edge. Sew on all four edges of the strip.

The edges having been made firm, lap the pointed end over square one for 3", and sew in place, using a simple cross-stitch (Figure 181) all the way around the napkin ring. The cross-stitching can be done before the ring is sewed together, and it is sometimes advisable to proceed in that way with very young children, as the manipulation is slightly easier, tho it takes longer, since the strip of burlap is longer than the circumference of the ring.

3. A SHAVING-PAD.

In designing the pattern, make it up on the order of a border on three sides. Cut a piece of burlap twice the length of the pad. The paper is cut slightly smaller than the burlap, so that the burlap will project over slightly at the sides and ends. The piece is doubled, so that it is just the size of the pad, and you have a double thickness of material. Blanket-stitch on three edges of this as shown in Figure 182. Sew thru both thicknesses, so that they become one.

After the blanket-stitching has been executed, begin applying the decoration, sewing thru the two thicknesses with the cross-stitch thread. Four holes are punched at the top for fastening the cover to the sheets of paper by means of brass fasteners or cord. Cord is most appropriate. If the jute is not to your

liking, untwist several strands and make a cord of several colors by twisting together strands of different colors of jute.

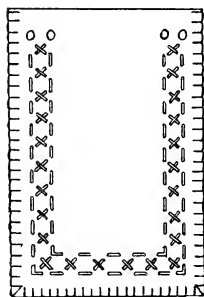


Fig 182

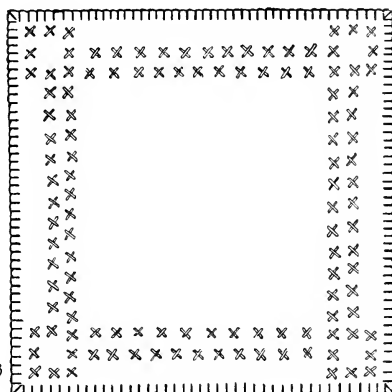


Fig 183

4. A HOLDER.

The working drawing in this case will be 5" square. Cut a piece of burlap 15" long and 5" wide, since the holder is to be made up of three thicknesses of material. The pattern may first be stitched on a 5" square at one end of the strip (Figure 183), then the piece folded evenly and blanket-stitched on four sides.

The holder is now finished. If desired, a hanger may be attached at one corner.

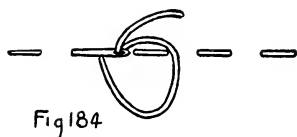


Fig 184

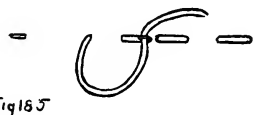


Fig 185

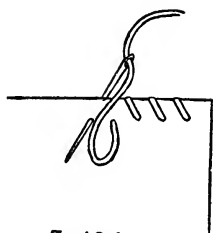


Fig 186

5. A NEEDLEBOOK.

The needlebook makes a very attractive project, and especially so at a time when making gifts. (See Figure 187.)

The pattern here again is made the size of the completed case, $2\frac{5}{8}'' \times 4\frac{1}{2}''$ being a good size. Cut a piece of burlap double the size of the pattern opening on either side of the end, as the drawing may call for.

Work the decoration on the front cover. Blanket-stitch on the four sides of the burlap, then it is ready for folding.

For leaves, cut two pieces of chamois slightly smaller than the burlap. These are sewed in or may be secured with a cord that shows on the outside of the book (Figure 187).

6. A CARDCASE.

The pattern for the cardcase is precisely the same as that for the needlebook (Figure 187). Cut a piece of burlap $4\frac{1}{4}'' \times 5''$, and two pieces $2\frac{1}{4}'' \times 1\frac{1}{4}''$. The finished size of the cardcase will be $2\frac{1}{2}'' \times 4\frac{1}{2}''$.

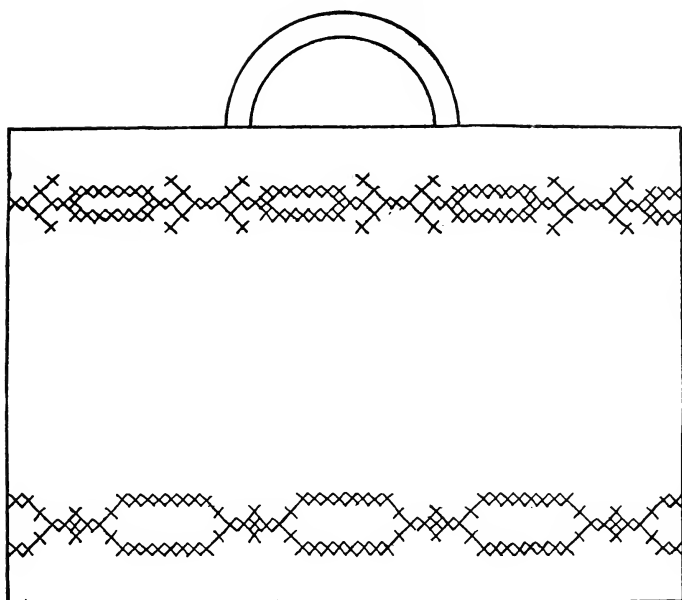


Fig 189

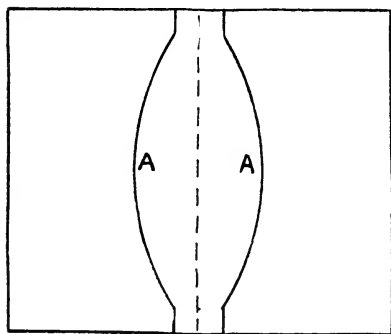


Fig 188

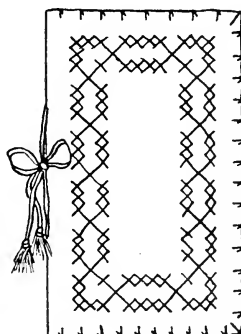


Fig 187

The small pieces are to be used for the pockets. Cut one side of each of these as shown at A in Figure 188. Next sew the decoration on the cover. Then place the small pieces for pockets in position on the large piece as shown in the same figure, and pin so as to keep them in place while sewing.

An over-casting stitch (Figure 186) may be used for sewing around the sides.

7. A BAG FOR BOOKS.

The piece of material for this is cut large enough to allow for seams at the ends and a hem on both sides at the top (Figure 189).

Turn the parts for the hem, and secure in such a way that the threads will not show on the outside. The running-stitch (Figure 184) may be used. Then fold in the center lengthwise, with the inside out. Sew the ends together firmly using the back-stitch shown in Figure 185. Turning bag, add the decorations, and it is ready for handles. These may be made of strips of burlap folded with the sides overlapping each other. Sew them to the bag on the inside. Another method of sewing the ends is to leave the bag right side out, and use the over-casting or blanket-stitch.

Handles may be braided of raffia and sewed on in the same manner as the burlap handles.

8. A PINCUSHION.

A pincushion may be made in two ways:

Cut two squares of material, decorate one, and blanket-stitch on three sides, stitching the two parts

for the cushion together. The small bag, filled with wadding or some other filling, is now placed inside, and stitching on the fourth edge completes the pillow.

Both sides can be cut in one piece. The decoration is next sewed on, and the piece accurately folded with the decoration to the inside.

Two of the open sides are sewed, using the necessary stitching. The cover is then turned with the decoration to the outside, the pillow inserted, and the fourth side sewed in a manner to make it resemble the sewing on the other two sides.

9. SOFA PILLOWS.

It is not necessary to go into detail as to the making of the pillow itself. Excelsior makes a fairly-good filling. Tree moss is excellent and also inexpensive.

The decoration differs from that of the other articles in this chapter. A cross-stitch pattern is not appropriate for a sofa pillow, since it would not endure the use to which a sofa pillow is put. So, in designing the decoration, something is to be planned which can be executed in color with a cord couched around the outer edges of the spots which make up the pattern.

After the plan for the pattern has been designed cut a piece of paper just one-quarter the size of the pillow-top. On this draw one-quarter of the pattern and cut on the lines that have been drawn. This gives us a kind of stencil. Placing it on the pillow-top and in one corner, draw lines with a lead pencil that will show where the dye is to be used. After dyeing

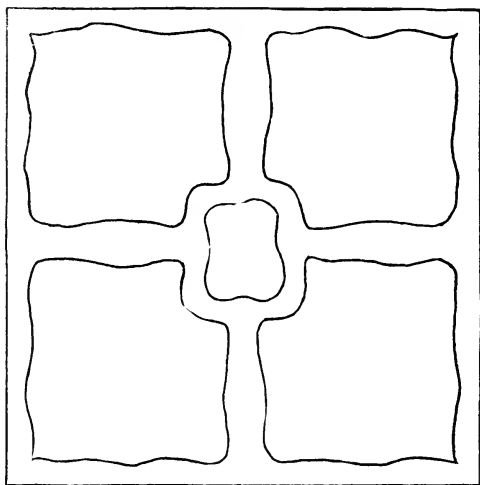


Fig 190

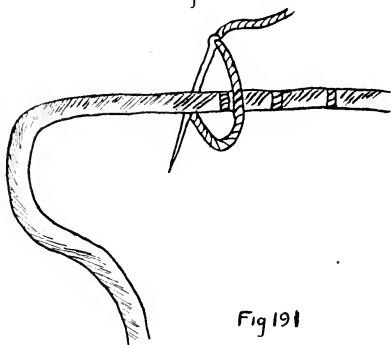


Fig 191

the couching is next in order. Referring to Figure 190 you will readily see that these spots are so large that something is needed to bind them. A heavy cord is couched around the edges of the color. The couching is represented in Figure 191.

VII.

WEAVING.

Both weaving and basketry are very primitive arts. Comparatively speaking, it has been only a few years/since weaving has been modernized. Steam and electricity are now used to aid in the process, and the old primitive looms have been replaced by modern ones.

The most primitive loom consisted of two sticks between which the warp threads were strung, and then the woof passed over and under by means of the fingers. One of these sticks was fastened to a branch, or something that permitted the other stick to hang down without quite touching the ground. Some tribes are said to have secured the warp to a loom constructed by driving four sticks into the ground and then excavating so that the weaver could sit with feet and limbs under the threads while weaving.

The first addition to the primitive loom was that of the shuttle, being nothing more than a stick to which the woof was fastened and passed across the warp threads.

Next we find a loom made of four sticks tied together at the corners. This kept the warp drawn tight and made the weaving easier. Then came the heddle, which helps to raise and lower the warp thread in crossing, and also keeps the warp from drawing together, causing the rug to be narrower in the center than it is on the ends.

The terms "warp" and "woof" used in the preceding paragraphs must be understood in order to learn how to weave. The warp threads are the threads that run lengthwise in the rug or fabrics. The woof is that which is woven back and forth crossing the warp threads.

Slowly, and at long intervals, improvements have been made, until we have to-day the wonderful Jacquard loom, which carries few marks of the primitive ones just described.

To-day, large hand looms are still in use in some of the foreign countries, and in many of the schools this lost art is being revived. We also find a great deal of this in the settlement work in many of the larger cities.

No school need be without the small hand-loom work, since this can be carried on without cost in the way of equipment.

This chapter affords far more material than will be needed by the teacher who is trying to teach the history of the textile or weaving industry, and it will give a better conception of it than volumes of printed material could possibly give.

In addition to discipline and technique, this art gives practical training in color and design.

Loom-weaving is preceded by paper-mat weaving, both single and double. And from this it is a perfectly natural step to the loom-weaving.

1. SINGLE-MAT WEAVING.

We shall use 8" squares of paper for this. Bogus is the most desirable, being cheaper and also well adapted to the use of water-color and crayon. With very young children some other paper which is colored may be used for weavers. Bogus paper may be colored very readily by dipping in Easy dye.

Two squares are needed for each mat, one of which is colored.

Fold one of these in the center, which will give an oblong 4"x8". With a ruler measure down 1" from each corner, placing dots at A and B. The corners referred to are the ones on the edge that does not have the fold. Connect these dots with the line AB in Figure 192. On the line AB and on the folded edge meas-

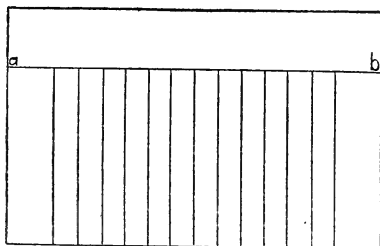


Fig 192

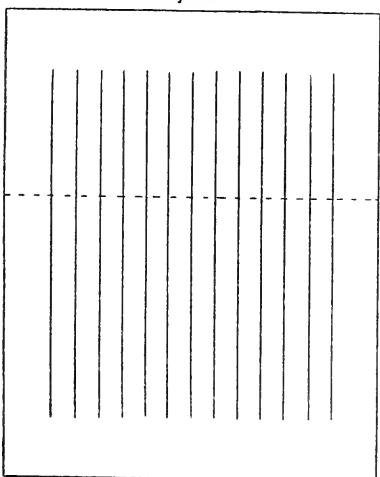


Fig 193

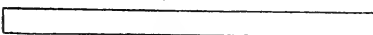


Fig 194

ure 1" from each end, and again make dots. This leaves a space of 6" between the dots. Divide this 6" line by means of dots into $\frac{1}{2}$ " spaces. Connect the corresponding dots in the two lines by means of pencil lines. Now take the scissors and cut on these lines, being careful to stop cutting just as you get to the line AB. Unfolding we have Figure 193, which is the square with incisions 6" long and a margin of 1" all the way around. The line AB in Figure 192 does not show, since that side has been turned, so that it becomes the under side of the mat. The dotted line shows where the mat has been folded.

Cut the second square into strips $\frac{1}{2}$ " wide, to be used as weavers. One of these is shown in Figure 194. Twelve will be needed for this mat.

For the first mat, when using this text without an instructor, use Figure 207 for your model or working drawing. Place the mat before you, and begin at the upper left-hand corner, and bring the end of the weaver thru up the first slit, passing it across and down thru the next, and so on until we have woven across to the other side of the mat. The second is started according to the pattern, beginning each time on the bottom side. Continue in this way until twelve are woven in. All of the ends being on the bottom side, they may now be pasted, thus keeping them in place, and the mat is finished.

After this is thoroly understood it may be taken up with the class, having them work out their design before cutting and weaving.

Figures 195, 196 and 197 show the mats executed in 1" squares.

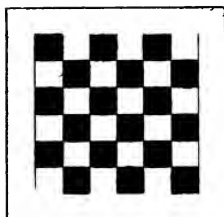
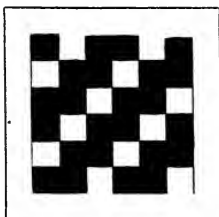
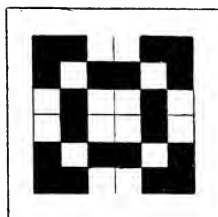


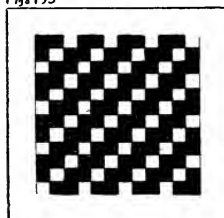
Fig 195



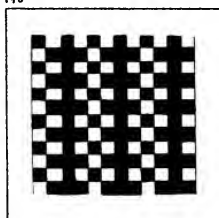
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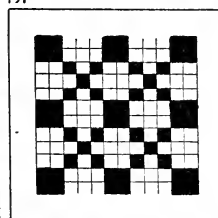
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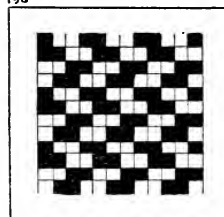
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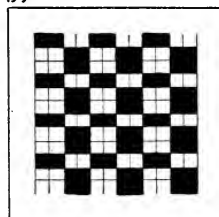
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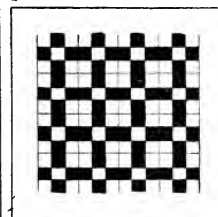
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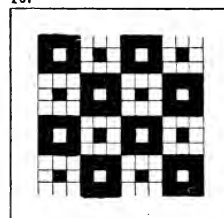
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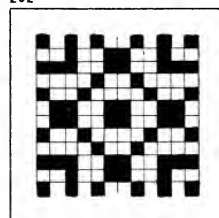
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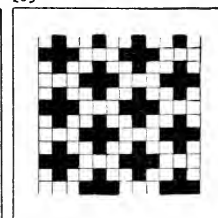
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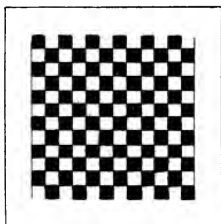
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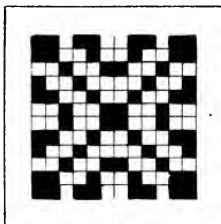
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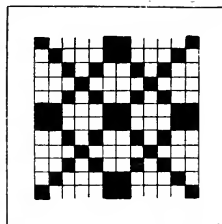
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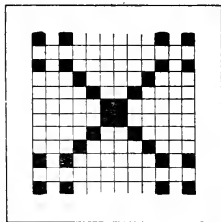
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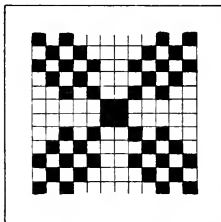
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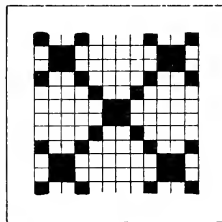
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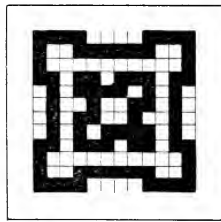
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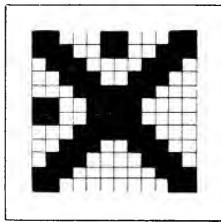
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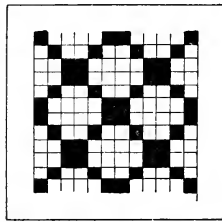
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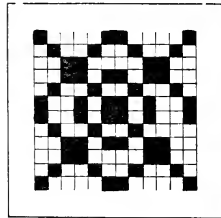
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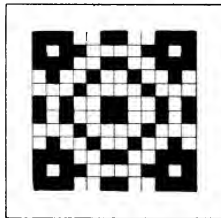
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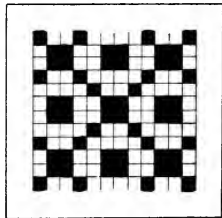
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218

To make the mats mentioned in the preceding paragraph, or, to be specific, as in Figure 195, start it in the same way as Figure 192, and place dots 1" apart instead of $\frac{1}{2}$ ". This is desirable for kindergarten work or at the beginning of mat-weaving with dull and backward children.

Much could be said about the patterns in Figures 195-218, inclusive. They are copies of mats that have been executed by children who had had no previous training in design, and have been inserted to encourage the teacher who is not very confident of success in this line. The patterns afford a large source of suggestions for designing straight-line patterns. Some of them make good patterns for linoleums if used just as they are, Figure 214 being one that will repeat well.

2. A WOVEN BOX.

Just a little in advance of the mats is the weaving of baskets, boxes, trays, etc. For a box 3" square and 1" high, cut a 6" square of paper and four colored strips $\frac{1}{4}$ " wide and 13" long. Fold the square into sixteen squares.

Have the children do this folding in concert. Especially in the beginning is this essential. If each one of them is permitted to fold his square individually, many of them will fail in their first attempt.

Let them first place the squares before them on the desk, and fold from the bottom up, creasing in the center. Next unfold, and again fold the lower half with the edge coming to the center, and then creasing. Unfold and turn the paper around, repeating this operation on the other half of the square. This

leaves the paper folded in four oblongs. Unfold and turn half-way around, repeat the preceding folds, and the sixteen squares will be formed.

In order to proceed with the box, cut out a square at each corner, which leaves Figure 219.

The dotted lines show where the paper has been folded. Make dots $\frac{1}{2}$ " apart on each side of the square in the center, which is made up of smaller squares. This large square will form the bottom of the basket.

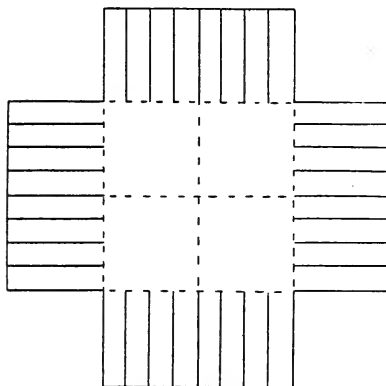


Fig 219

Draw lines from each dot to the outer edge of the basket, keeping them parallel by holding the ruler in line with the dots on opposite sides of the square. After lines have been drawn on the four sides, cut to the large square forming the bottom. Begin weaving, and weave the

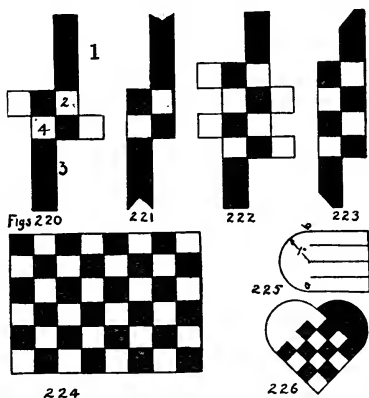
four strips on one side, then turn up at the corner and weave across the next side in the same way. Continue in this manner until you have woven the fourth side, and then fasten by pushing the weavers in on the side first woven. The top is finished off by bending the spokes that are on the outside of the box over the last weaver, and pushing them down on the inside under the weaver preceding the one used in the last time around. The other spokes are cut off even with the top. A little paste may be used on the ones pushed down, making the basket more permanent.

Trays are made in the same manner. Baskets are made by the use of an oblong piece of paper and the addition of a handle. Square baskets may also be made.

3. RIGHT AND LEFT WEAVING.

This is desirable for all children, since it cultivates ambidexterity (using both hands with equal skill and ease); and, as we advance in the handicrafts, we shall realize more and more how often it is convenient for the left hand to take the lead at given intervals. Only a few problems will be given.

Bookmarks afford quite a range of subject-matter. For a small and simple bookmark take two strips of bogus paper $\frac{3}{4}$ " wide and $4\frac{1}{2}$ " long, and two colored strips 8" long.



Fold each strip in the center lengthwise and crease.

Referring to Figure 220, take No. 1 in the left hand with the open end projecting up, and place around it colored strip No. 2 with the open end to the left and about 1" above the closed end of No. 1. Open No. 3 and place it around No. 2. Then opening No. 4, placing it around No. 3, the open end may be slipped between No. 1, thus making ready to draw all together firmly. A little paste is added between the strips where they cross, the ends of the bogus paper

are cut off close to the colored strips, the ends cut as shown in Figure 221, and the bookmark is ready for use.

Figures 222 and 223 show a more elaborate bookmark, using two colored strips 12" long, and four bogus strips 8" long. The process is so similar to Figures 220 and 221 that no further explanation is necessary.

Mats similar to Figure 224 may be woven like the bookmarks, except that more strips are used and all of the ends cut off. Figure 224 necessitates eight colored strips $\frac{3}{4}$ " wide and 15" long, and six bogus strips of the same width and 18" long.

Wall pockets demand a more difficult construction, and afford good training. A good size may be had by cutting a piece of colored paper 2" wide and 6" long, and a piece of bogus of the same size. Fold each of these in the center, and crease (Figure 225). Measure down 1" on each side from the open end, making dots at A and B. Connect with pencil line, and mark off on this spaces $\frac{1}{2}$ " wide, as well as on the closed end. Using the central dot as a center, draw the semi-circumference as indicated. Next cut on the line made with the compass, and on the lines connecting the dots on the closed end, and the line AB.

Now weave together, which gives the pocket in Figure 226.

Pincushions and pillows may be constructed from ribbon, making use of the weaving in the foregoing exercises.

Make a frame of the desired size by nailing four sticks together at the corners. Take one color of the ribbon and fasten to the loom, passing it back and

forth, and fastening it at the ends by means of thumb-tacks, pins or brads. Next take the other color of the ribbon, and weave back and forth on this, forming what resembles the mats that have been woven. Before removing from the frame it will be necessary to stitch on the four edges to keep it from coming apart. This gives the top half of the pillow. The other half may be woven in the same manner, or a piece of fabric used instead.

4. HAND-LOOM WEAVING.

With a good understanding of paper-mat weaving, the loom-work which follows will be understood quite readily. Cardboard looms, those made of cigar boxes, and pillow looms, will be treated.

The terms "warp" and "woof" already defined at the beginning of this chapter will be used frequently.

Materials used are chenille, carpet rags, jute, jute twine, filo strands, raffia and others. Raffia and jute twine are those that are in most common use.

Jute is a vegetable fibre, being produced from the bark of a tall shrub which grows to the height of eight to fifteen feet. For our use we may call the plant "jute" (*conchorus olitorius*). This fibre produced in the bark is known as "bast fibre." It grows wild in India, and where cultivated it requires no work save thinning out where it has been too thickly seeded. It is also cultivated by the Chinese and Malays. Jute can be grown along the line of the Gulf States from Texas to South Carolina, but not in competition with India jute, which is only $1\frac{1}{2}$ to $2\frac{1}{2}$ cents per pound.

The fibre of jute is one of our most useful textiles, tho quite inferior. Its lustre and cheapness, and the fact that it takes dye readily, cause it to be used for purposes of adulteration, tho it is not difficult to detect such frauds. It enters into all classes of textiles as well as burlap, bags, ropes and all kinds of cordage. Where cheapness is an essential, it is most desirable.

Raffia will be described in the chapter on raffia. The other materials here mentioned are so common as to need no special comment.

A rug on a cardboard loom is an easy stepping-stone from the mat-weaving. The mats have given some definite idea of decoration, so that the designing of this rug will be simple. In the way of decoration we shall use only two bands or stripes. The proper width and spacing of the bands are essential. In designing the pattern begin by cutting a piece of plain paper just the size of the finished rug, the width of which should be divisible by $\frac{3}{8}$ " , and draw the bands on this in lead pencil (Figure 227).

After the design is made we are ready for the loom. Cut a piece of heavy strawboard, or, better, a piece of mounting-board 1" longer and $\frac{3}{4}$ " wider than the rug is to be woven. Measure down $\frac{1}{2}$ " from each end, make dots, and draw the lines AB and CD in Figure 228. On these lines place dots $\frac{3}{8}$ " apart, and cut out niches as shown at the end that has line AB. The other end shows the loom before niches have been cut.

The loom is now ready for warping (sometimes called "threading"). Use brown carpet warp, and, be-

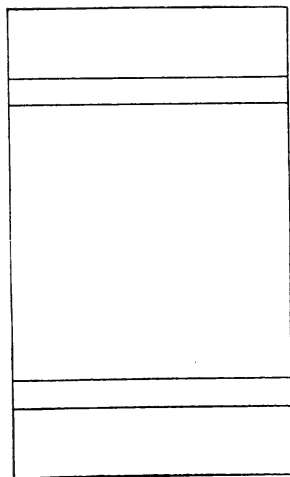


Fig 227

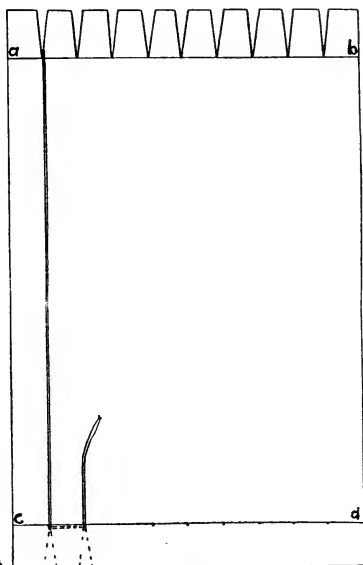


Fig 228

ginning at one side of the loom, fasten the end of the warp by making a knot and slipping it in the first niche. Pass it along to the niche on the opposite end, and then passing it under the loom, indicated by the dotted line at the lower left-hand corner of Figure 228, come up in the second niche. Continue in this manner until the loom is threaded, and then fasten the ends.

Choose two colors for woof that will work up well together. Begin by taking enough of the body color of the rug to weave up to the band. This, as has been explained in the woof, is woven over and under the warp threads until you have woven across the loom (Figure 229). Then draw thru all but $1\frac{1}{2}$ " of the woof which is left on the side from which

you started. Take the end and weave it above the woof thread just woven across (the space between the woof thread and the opposite end of the loom), going over the warp thread that it first went under, and *vice versa*. Let the end remain under the warp threads which will be the bottom side of the rug. Continue by returning with the woof, weaving over one and under the next, etc., until you have woven as far as this color is to go, which can be determined by slipping your pattern under the warp threads. The end of the thread is fastened in the same way as it was fastened in the beginning. Now, when you start with another color, begin on the side opposite from the one on which you stopped. This is done in order that both sides of the rug will be even. As you weave back and forth keep the woof pushed up tightly. A stick used for this purpose is called a "batten." An ordinary ruler makes a good batten. While weaving do not draw the woof too tight, or the warp threads will pull in, causing the rug to be narrower in the center than it is on the ends.

After enough of this second color has been woven, begin at the other end, and repeat what you have done at the first end; then the remaining space is woven in with the color first used. Another way of weaving is to begin at one end and continue across without stopping and changing to the other end.

After you began weaving you probably learned that the fingers did not make a good shuttle (the shuttle is that on which the woof is wound and used to pass it back and forth, over and under the warp threads). It is hoped that you devised some form

of a shuttle. It may have been a piece of cardboard, with a hole cut in one end for holding the woof and then used as a needle. This is probably the simplest shuttle that can be devised. A weaving-needle, a stick notched at one end to which the woof is tied, or a piece of wire, may also be used. When giving this problem to the children let them discover for themselves that they need some kind of a shuttle, and then have them devise one, thus developing initiative.

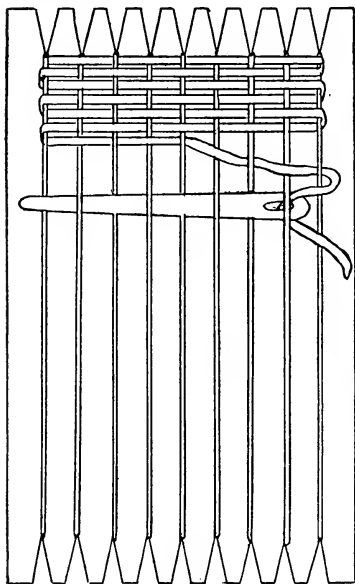


Fig 229

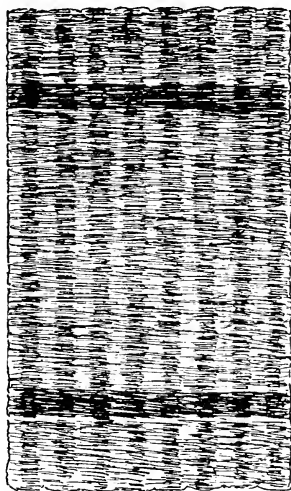


Fig 230

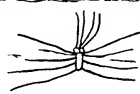


Fig 231



Fig 232

The rug is finished by taking it from the loom, fastening the ends of the warp thread, and slipping the woof towards the ends, filling the loops out evenly that

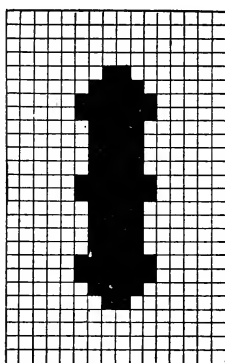
had been hooked around the projections at the end of the loom. The finished rug is shown in Figure 230.

The fringes may be made by cutting pieces of jute twine about 1" long (Figure 231), and tying in the center with a light piece of cord; then doubling and wrapping just below where it was tied (Figure 232). Cut the ends off evenly and fray out. The fringe is now ready to be attached to the loops of the warp.

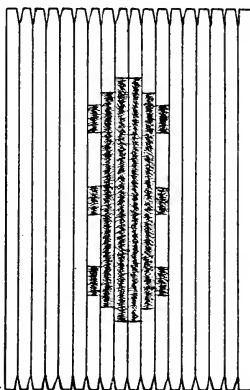
Another rug is given to illustrate the working of a pattern on a hand loom.

The designing of the pattern comes first. Cut a piece of blank paper the size of the rug, and rule lines $\frac{3}{8}$ " apart, both lengthwise and crosswise. This will give a piece of cross-ruled paper made up of $\frac{3}{8}$ " squares.

The single weaving will be a great aid here in the design. Keep the children at the execution of simple centers in the beginning, and always use large



Figs 233



234

spots in preference to a group of smaller ones, as they are difficult to execute and do not look well, as a rule, even when properly executed. After the form and size of the center have been decided upon (Figure 233), have the pattern made in color, using the same two colors for each pattern, but interchanging them so as to see which arrangement of color is best.

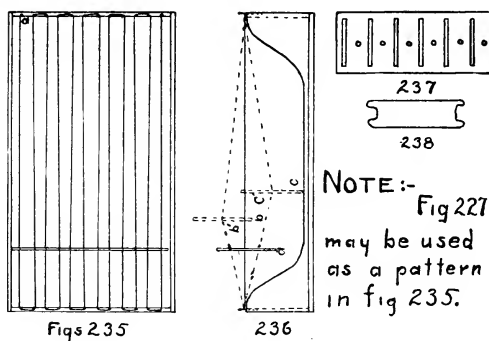
The center is woven as shown in Figure 234. Place the pattern under the warp in order that the center is properly located. Then the other part of the rug done in another color is woven. A weaving-needle or a large raffia needle is necessary, after the center has been woven, to use in passing the warp back and forth.

As can be seen from Figure 234, after the center is woven you should start at the end and weave until it is filled up to the color, then fill out to the other end, and, lastly, fill in on both sides of the center.

It is sometimes desirable to fasten a knitting-needle or a piece of stiff wire along with each outside warp thread to keep the sides from drawing in while weaving. After the rug is woven the needles are readily pulled out and do not injure the rug.

A *box loom* is somewhat in advance of one that has been constructed of cardboard.

This will also involve the heddle shown in Figure 237, which is a device for raising and lowering the warp threads, making it possible to save much time in weaving. The shuttle already referred to is shown in Figure 238. The woof is wound around the shuttle, and then it is passed back and forth in weaving. The shuttle may also be used as a batten.



NOTE:- Fig 227
may be used
as a pattern
in fig 235.

Design the pattern carefully so as to get good proportion, and do not have it too large to be woven on the box from which you are going to construct your loom.

Remove the lid from the cigar box and cut away a part of the sides, as shown in Figure 236. Drive brads on either end at intervals of $\frac{3}{8}$ ". Having done this, we are ready for stringing the loom. Carpet warp is used as before. Fasten this to the first brad (A) in Figure 235, and pass thru the long opening in the heddle. It is then carried on around the first two brads on the other end of the box, and back thru the heddle, passing thru the small circular opening and on to the end of the box from which we started. It is then carried around the second and third brads, passed thru the heddle and continued in this order until the loom is warped.

In the side view of the loom, A in Figure 236 shows the heddle at rest, and ready for weaving. Begin weaving by raising the heddle as indicated at B. Both the heddle and the warp thread are shown

by dotted lines in the position that they will assume. The warp threads passing thru the circular opening are the ones that are raised while the other warp threads remain at rest, the long slits or openings making it possible. Having the heddle raised, and understanding the position of the warp threads, the shuttle is passed between the two sets of threads thru the opening B'. Lowering the heddle to the position C crosses the threads, and the shuttle is passed back thru the opening C'. This is continued, and we find the same result in a far shorter length of time than was the result with the cardboard loom.

Raffia rugs or mats may be woven on either the cardboard or box loom. The raffia can be used with carpet warp or strands of it split, which make very serviceable warp. The woof should be kept flat in weaving; that is, the strands of raffia spread out. This permits of very pleasing effects if natural and colored raffia are combined.

Fringes are added in the same way as the one in Figures 231 and 232.

Hammocks are woven in nearly the same manner as the rugs.

The hammock is to bag when finished, so a loom with circular ends is needed. But, in designing it, it is not necessary to make the ends curve, provided we are going to use the compass for laying out the ends of our loom. If no compass is to be used, which is never preferable, cut an oblong the size of the hammock. Fold both lengthwise and crosswise. Draw a curve to represent one-half of an end, beginning at the open end and at the side that has the open

corners. Cutting on this line gives the proper shape to the loom.

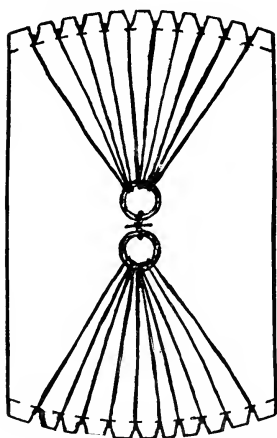


Fig 239

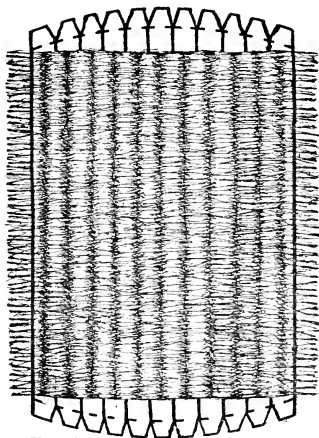


Fig 240

After the design for the hammock has been made (this may have bands of color similar to that of the rugs), trace the form of the loom on a piece of cardboard and cut out the loom. A line is drawn lengthwise on the center of the loom, and the center of this line located. The hammock rings are now to be put in place. The heavy harness rings are not well adapted to this work; therefore, do not use them unless you cannot get the embroidery rings. $\frac{3}{4}$ " or 1" is a good size.

Prick two holes in this line drawn lengthwise on the loom, one $\frac{5}{8}$ " above the center and the other $\frac{5}{8}$ " below the center. Sew thru one of these and back thru the other. Then, slipping a ring over each end of this thread, tie the ends together, and the rings will be kept in place. (See Figure 239.)

For warp we may again use carpet warp or any other suitable material at hand. Begin warping by securing an end to one of these rings, and then pass it over the niche to the outside on the left, going the length of the loom on the other side and coming back in the same niche on the opposite end, and passing thru the second ring. Continue by passing from the second ring back to the end nearest it, and so on until the loom is warped. The end is now secured and we are ready for weaving.

Begin weaving in the woof, but this time we are going to have a fringe on either side. As you pass across the first time leave about 1" of the woof that is not drawn thru. Then, as you weave back, leave the same on the second side. This is not an end, but a loop, and will be cut later. Continue until you have filled this side that does not have the rings.

If left in this way the hammock would not last long, so thread a needle with carpet warp and blanket-stitch the woof (Fig. 180) to the warp on the ends and sides, securing it in such a manner that it will not pull out. After sewing, the projecting ends of the woof are all cut off evenly, and may be frayed out easily by splitting with a pin.

Use this same needle threaded with carpet warp to weave back and forth a few times close up to the rings, so that they will remain in position after the hammock has been taken from the loom.

Pillow looms and the making of porch pillows are treated in the latter part of the chapter on raffia.

A Bag made entirely of carpet warp will not be found out of place here. The design precedes the

making of the loom, but is not represented by a figure. It should not be larger than 2"x3" when finished, and several colors may be combined. The warp may be white or colored, and the woof of several colors worked by alternating or using bands to make the decoration.

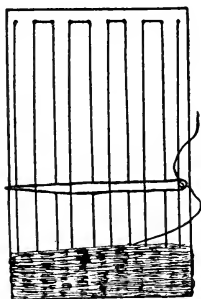


Fig 241

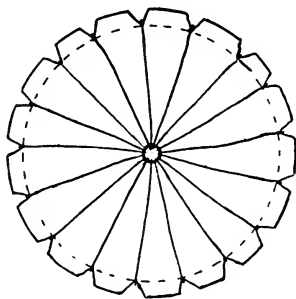


Fig 242

Cut a piece of cardboard $\frac{1}{2}$ " longer than, but the same width as, the bag. Rule a line $\frac{1}{2}$ " from the end, and stick pins half-way thru at intervals of 3-16" on this line. The first and last pin should be but 3-32" from the end of the line, since we are going to weave around this loom, and that will make all of the spaces between the warp threads equal.

Warp the loom by securing the end to one of the pins, pass it down around the end and up over the part of the same pin which projects thru on the back side of the loom. Take it on over the second pin on this back side, and continue in this manner until the loom has been warped.

Figure 241 shows the loom warped and the woof started. It is woven around the loom, and, when you

have woven to the loops at the top of the loom, put in two drawstrings, one to pull toward the right and the other toward the left. (In weaving you discovered that an odd number of warp threads were necessary.) A tassel (Figure 232) may be attached to the end of each of the drawstrings if it is so desired. The drawstrings may be put in a few rounds before the bag is finished, which makes the bag more attractive.

Circular weaving demands a circular loom (Figure 242), which is warped ready for use.

Cut a cardboard circle $\frac{1}{2}$ " larger than the size of the desired rug, which allows for the making of niches $\frac{1}{4}$ " deep on the circumference of the cardboard. Cut a hole in the center $\frac{1}{4}$ " in diameter. Warp the loom by passing the thread thru this opening in the center and up on the outside, and continue until there is a warp thread in each of the niches.

The loom has warp on both sides, but is to be woven on one side only. Begin weaving at the center, and weave around, weaving over and under as before. This demands an odd number of warp threads, the same as the bag.

When the mat has been woven to the outside the end is secured. Cut the warp threads on the back side of the loom, half-way between the center and the circumference. The outside ends are now tied to prevent the woof from slipping, and form a fringe. The ones in the center are sewed or worked into the underside of the rug.

Mufflers make an attractive problem in weaving and merit a better material than jute. They may be woven with or without stripes at either end.

Use a loom 19" in length. Cardboard is not strong enough for this, tho it can be used if necessary. It is usually possible to get a board of this length and of a suitable width. Dry-goods boxes provide excellent material. Drive nails at the ends on which to string the warp. In weaving draw the woof tighter in the central section, thus making it narrower, so that it will fit better at the neck.

VIII.

RAFFIA WORK.

Raffia is the fibre of a palm, or, rather, the outer covering of the palm, and is imported from Madagascar. It comes from the African palm, and is harvested before the leaves are fully developed.

This fibre is gathered and cured by the natives, both men and women. It is made into large hanks or braids, and these in turn are made into bales weighing 225 pounds. The bales are then exported.

Raffia was first imported and used as ties by nurserymen. It has proven to be a most excellent thing for handwork. The natural raffia is quite artistic. If a variety is desired, it can be dyed. Some authors say it takes dye readily, but such is not the case, as it resists the dye more than any other material that we use; but, if the following hints are observed, anyone can dye raffia successfully. The chapter on design gives suggestions for vegetable dyes.

Of the aniline dyes, Easy Dye is perhaps of the most satisfactory. To prepare the raffia for dyeing, unbraid the hanks and wrap them in wet cloths or newspapers, and leave overnight. If dyeing must be done at once, soak the hanks in water for an hour or two.

The dye is dissolved in boiling water. Then place the raffia in this bath and let it boil for ten minutes. If several hanks are to be dyed in the same bath, a little more of the dye must be added for each bath, or the raffia will be of a lighter color.

Raffia has been used to supplement the work in the chapters on burlap-weaving, and basketry could not be elaborated on at all without it. Here it will be treated not as a means to an end, but as the end in itself so far as material for the handwork is concerned.

1. WRAPPED-WORK.

In wrapped-work it is necessary to have something to use as the framework around which the raffia is wrapped. This is called the foundation. It usually consists of heavy strawboard or cardboard. The raffia must be kept well spread out while wrapping, so as to get the benefit of the full width of the stand.

A *napkin ring* is the simplest of these (Figure 244). Decide on the length and diameter of the ring. Then, finding the circumference, cut a foundation as wide as the ring is long, and whose length is this circumference plus $\frac{1}{2}$ " for lapping.

Execute by lapping the foundation $\frac{1}{2}$ " and sewing to make secure (Figure 243). Begin wrapping, using the wide end of a strand of raffia. Cover this end and continue wrapping, being sure that no parts of the foundation show until another strand is needed. A new strand is started without knotting by simply wrapping over the end. Secure the last end by pushing it under the raffia on the inside of the ring.

A *circular frame* is made by having the material for the foundation cut in squares. This affords an opportunity of teaching the term "diagonal." Have the children draw diagonals so as to locate the center.

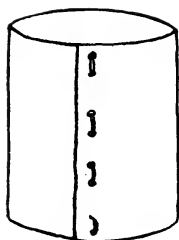


Fig 243

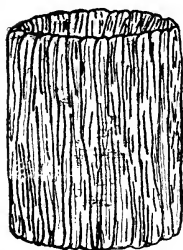


Fig 244.

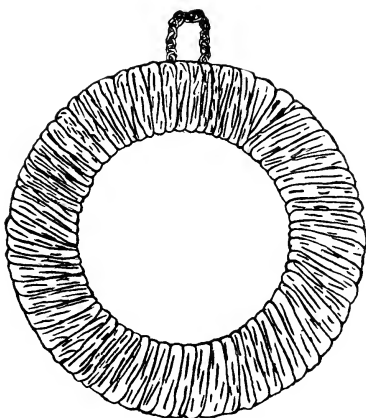


Fig 245

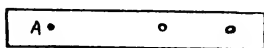
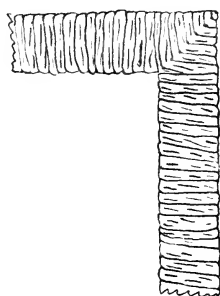
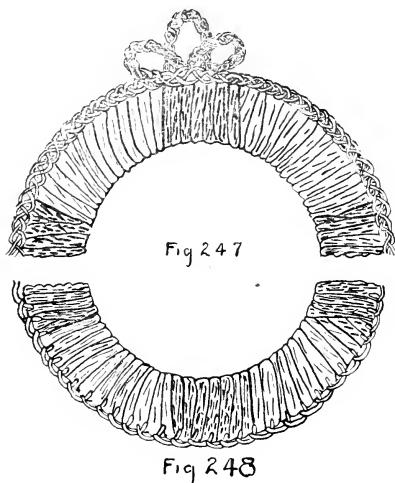


Fig 246

For a compass cut a narrow strip of cardboard (Figure 246). Near one end (at A) push a pin thru the cardboard. Then from this point measure a distance equal to the length of the radius for the inside circle or opening in the frame, and make a dot. Push a pencil thru this opening, and, with the pin at the point where the diagonals cross, draw the circle. Locating the dot for the radius of the outside circle, draw it in the same manner.

Figure 245 shows the finished frame. This circular piece of cardboard with the circular opening is now wrapped in the same manner as the napkin ring. A small loop is attached for hanging.

It is not well to give this exercise without first designing the frame so as to accommodate some picture. This does not mean that photographs are necessary or prints must be bought. Pictures cut from magazines will meet the requirements. After the frame has been completed paste the picture on the back of the frame, then cut a piece of paper slightly smaller than the frame itself, and paste it over the picture. In designing the frame the width of the frame should be considered in proportion to the area surrounding the picture.



Figures 247 and 248 illustrate how the circular frame may be varied. In Figure 248 is shown how natural and colored raffia may be combined; also, the blanket-stitch, illustrated in Figure 180, is used on the edge for decoration. In Figure 247 a braided

strand of raffia is sewed around the edge of the frame and looped at the top. These frames may be made in ovals as well as circles.

Figure 249 shows the method of wrapping a square frame. The miters are pierced and sewed thru in wrapping as indicated in the figure. Raffia needles are necessary for passing the raffia thru these piercings.

Calendar mounts are made like Figure 250. An oblong foundation is used and diagonals drawn. The full length of the diagonals may be pierced lengthwise so that the miter runs from the corner to a line passing lengthwise thru the center of the frame. Or it may be executed similarly to that of the picture frame in Figure 249, and the calendar pad mounted on this. The latter plan is shown executed in Figure 250. The diagonals are drawn as before, but a smaller oblong is drawn on the card inside of the large one, and holes pierced on the four miters. It is then wrapped, sewing thru the piercings as indicated.

Thermometer mounts are made like the calendar mounts. A piece of bristol board (other stiff paper may be used) is used to mount the thermometer on, and then the bristol board is secured to the raffia mount (Figure 251).

The match-holder and scratch (Figure 252) requires a little more time, but is readily constructed. The mount or back is made the same as in Figures 250 and 251. A piece shaped like Figure 253 is cut for the holder. Diagonals show that it is covered the same as tho it had been intended for a mount. It is fastened in place by sewing edges A and B to the back. A piece of cardboard is then cut, which fills

the opening, and sewed in place to form the bottom. It may be covered with raffia if desired. A piece of sandpaper is then glued on below the box to form the scratcher.

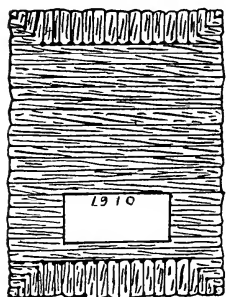


Fig 250

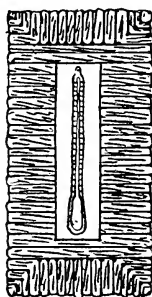


Fig 251

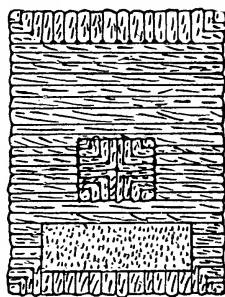


Fig 252



Fig 254



Fig 255

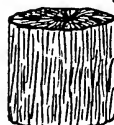


Fig 256

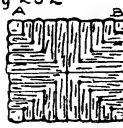


Fig 253

Circular boxes are made like Figure 256. Cut two circular pieces of foundation material the same diameter as that of the box. In the center cut a small circular opening. In wrapping pass the raffia thru this and to the outside, and on around and thru the central opening again, etc. (Figure 254). The oblong piece shown in Figure 255 is for the body or sides of the box. It is overlapped and sewed and wrapped like a napkin ring (Figure 243). One of the circles is sewed to one end of this cylinder, forming the bottom. The cover is then hinged by sewing with raffia in one place only.

This may be varied by making the top and bottom larger than the diameter of the box itself, thus projecting over the sides all of the way around.

Making the opening in the center larger, gives us a hair-receiver.

Decoration in cross-stitch may be added; also mass decoration by sewing with colored raffia can be executed.

Square and oblong boxes can be constructed by making the parts in the same manner as the mounts for Figures 250-252, and then sewing them together to form the boxes.

2. BRAIDED WORK.

In making a braid always start with the large ends of the strands of raffia. Several strands of raffia are used for each strand of the braid. Just as soon as the braid becomes thin, add more raffia, inserting a few strands at a time. Do not mind the ragged appearance that these projecting ends present when starting additional strands, since they may be cut off close to the braid after the braid is finished. In sewing the braids together use a fine strand of raffia that has been provided by splitting a larger strand.

Mats.—It is not necessary to braid more than several feet before beginning to make the mat (Figure 257). The braid is laid on edge and sewed. Be sure to get it round in the beginning, so that the mat will not be flat on one side when finished. When you have sewed to where you left off braiding, more

raffia is added to the braid. After the mat is of the desired size a border is sewed on as indicated in the figure with the raffia placed flat and not on edge.

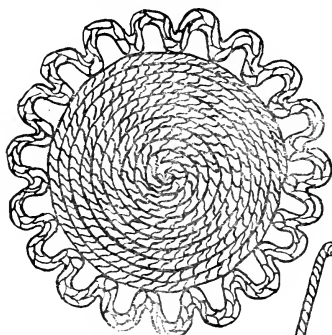


Fig 257

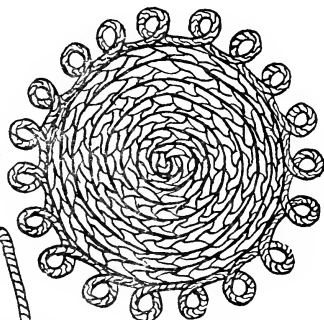


Fig 258



Fig 259

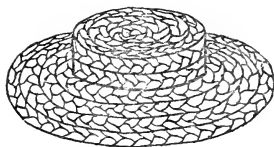


Fig 261



Fig 260

If an elliptical mat is desired, the beginning should be straight for, say, an inch, then doubled and continued in the same manner as a circular mat.

Another form is shown in Figure 258. The braid is placed flat and the edges sewed together. The border is made in the last time around the mat and is a part of it.

Bags are illustrated by Figure 259. Two circular mats are made and sewed together, leaving an opening at the top. Braids for carrying or hanging are added last.

Trays and baskets are started like the mat in Figure 258. After the bottom is large enough turn the braid to conform to the form of the sides, and continue sewing. A drawing should be made and followed as in Figure 301 under basketry. A tray is shown in Figure 260. These make attractive trays and serviceable baskets if not made too large. Small jewel-cases can be made by lining the basket and making a cover for it, which is hinged by sewing in one place with some raffia.

Hats.—Doll-hats afford a great deal of pleasure and develop initiative. A representative one is shown in Figure 261. The beginning is the same as that of a basket if a flat top is desired. Then the sides of the crown are the same as the sides on a basket. The brim is started after the crown has been woven tall enough, and the hat is readily completed.

If the top is to be other than flat, it is easily accomplished by drawing the braid quite tight in sewing, which will cause the top to bulge upward.

Rugs and mats are treated in the chapter on weaving.

3. KNOTTED WORK.

Shopping-bags knotted from raffia are very attractive. The first bag is made using the over-hand knot.

To begin the bag use a cord or strand of raffia, knotted at the ends, around which to hang all of the strands of raffia. Each strand then gives two ends. For this we use eighteen strands of natural raffia. Begin knotting by making an over-hand knot just below the foundation on which these eighteen strands have been hung. Figure 263 shows how the over-hand knot is made, tho nearly everyone is familiar with it. The second time around take one strand from each knot. Figure 262 illustrates this. Continue and alternate. The longer the space left between the knots the larger the meshes become, and consequently a wider bag is the result. The bottom is made by knotting the ends of opposite sides together and cutting evenly and fraying out.

Two braids are then made to be inserted around the top and used as drawstrings. After inserting them with two ends on each side, tie the ends together and add a tassel. (See Figure 232.) Bags are sometimes made with only one drawstring, but these do not carry well, and look as tho they were heavily loaded on one side.

Another bag quite similar to the preceding one, except that it involves a more difficult knot, will now be considered. Use eighteen natural and eighteen colored strands of raffia. A stirrup is used as in the preceding bags. The strands of raffia are placed two in a group—one natural and one colored—where we had only one strand in the other bag. This gives four ends. One natural and one colored end are held together, and the other two tied around it. This knot is now executed by working first as shown in

Figure 264 A, and then Figure 264 B, lastly drawing the ends quite tight.

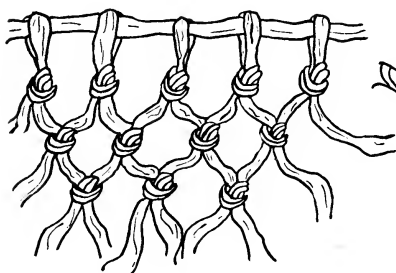


Fig 262

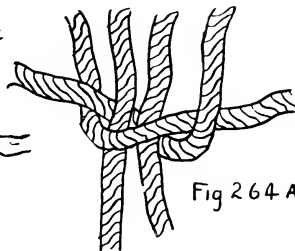


Fig 264 A

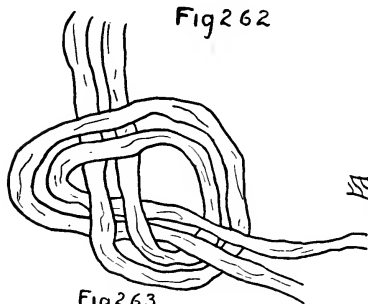


Fig 263

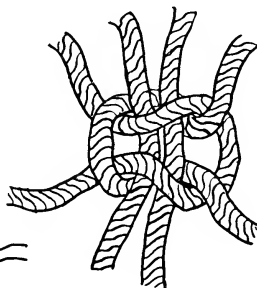


Fig 264 B

Proceed by knotting once around in this manner. The second time around use two of the four strands with two of the strands from the adjoining knot, and continue until the bag is of the desired depth. The bottom is closed by knotting together the strands of the opposite sides. The bag may be lined with suitable material, something that will harmonize with the color of the raffia in the bag.

4. PORCH PILLOWS.

Porch pillows may be made of raffia, long grasses or straw.

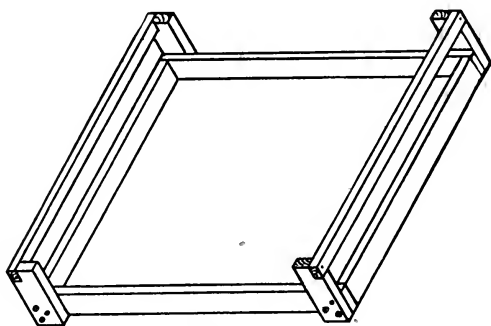


Fig 265



Fig 266

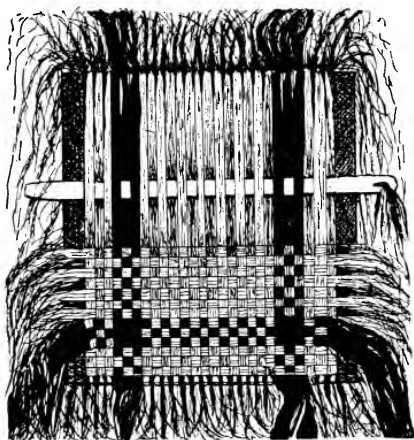


Fig 267

The making of the loom and a pillow of raffia will be discussed here.

The construction of the loom is the first consideration. The one in Figure 265 is one of the possible constructions, and is quite satisfactory. Take two pieces of wood $\frac{3}{4}$ "x2"x21 $\frac{1}{2}$ ", two pieces $\frac{3}{4}$ "x2"x23", four pieces $\frac{3}{4}$ "x2"x5", and two pieces $\frac{3}{4}$ "x1"x24 $\frac{1}{2}$ " long. The figure shows how it is put together. Nail the 23" pieces to the 21 $\frac{1}{2}$ " pieces, making a square frame. Next cut a notch at one corner of each of the 5" pieces, $\frac{3}{4}$ "x1", into which the $\frac{3}{4}$ "x1" pieces are to be nailed. Nail the 5" pieces after notching to the square frame on the sides that have the 23" pieces. The two remaining pieces are now nailed in the notches, and the loom is complete, the last two pieces being the ones to which the warp is secured.

A needle (Figure 266) made from a piece of wood $\frac{1}{4}$ "x1"x24" is also needed. Cut an eye in one end by boring two holes $\frac{1}{4}$ " in diameter and $\frac{3}{4}$ " apart. Cut a tangent on each side, joining the two holes and forming the eye. Both colored and natural raffia, or natural alone, may be used in weaving the pillow. In the pillow shown started in Figure 267 twenty-six warp threads are strung, and an equal number of woof threads are to be used.

By warp and woof threads here are meant bunches of raffia made up of from eight to twelve strands, depending upon the size of the raffia.

To string the loom, begin by taking the large end of the strand and tie. Take it across to the other bar and tie the small end. The second one is first tied with the large end beside the place where the small

end of the first one was tied, and in that way the large and small ends alternate. After the three natural ones come three colored, then fourteen natural, three colored, and, lastly, three natural ones. After the warp is strung, thread a raffia needle and blanket-stitch across each end, so as to secure them and keep them in place.

Begin weaving in the woof by threading the needle with a bunch of raffia equal in size to that of the warp. After the woof is woven in, stitch across the ends the same as on the warp.

This will make the top of the pillow. Weave one of just the same size from the natural raffia for the back. Sew three edges together and fill with excelsior, moss or other suitable filling, and then sew the fourth side. The ends are then cut evenly, and the pillow is complete.

IX.

SIMPLE BOOKBINDING.

As is suggested by the title of this chapter, we shall not go very deeply into the art-craft of book-binding.

Without equipment other than a punch and scissors we cannot go thru even the simple processes involved from the "forwarding" to the "finishing" of a simple book, but must be content with the making of desk-pads, folios, loose-leaf covers, covers with simple hinge fastenings, etc. Let the simple beginning that we make in this craft be practical. Nature-study, language and other subjects will demand books that can readily be constructed by the children. Become familiar with the way of the practical craftsman by examining pieces of finished work, being careful to notice the detail; and, any time you are in doubt about something not given in this chapter, proceed by returning to your bound book. When doing the more complicated work it is often desirable to take a book to pieces in order to understand the construction thoroly. Desk-pads are taken up first, since they readily pave the way to the making of simple portfolios.

The pupil should be familiarized with the end papers and the fly-leaves at the front and back of the book. His attention should also be called to the arrangement of the pages with reference to spacing, margin, etc. Books having covers of good design

should be shown and note made of the fact that the lettering is rarely in an oblique line, but nearly always carried straight across the cover.

1. DESK-PADS.

The materials needed are a piece of strawboard, a piece of cover-paper slightly larger than twice that of the strawboard, some book-cloth, paste and a blotter.

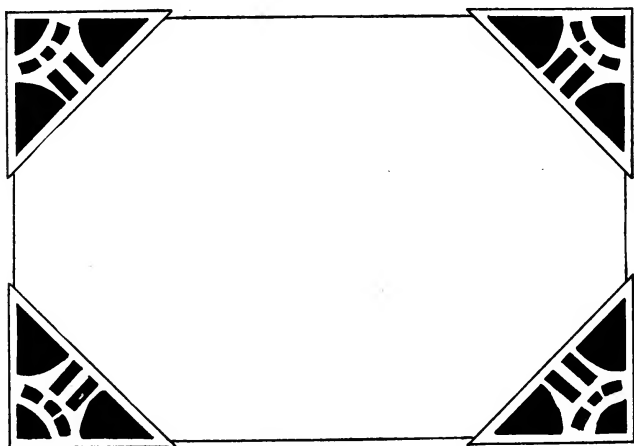


Fig 267

The first step in the process is the making of a working drawing (Figure 267) and designing the decoration for the corners. Figure 267 is the finished pad and makes a good proportion. A good size for a small pad is 9"x12".

After the drawing has been made, cut the piece of strawboard just the size of the pad. This is called the "foundation."

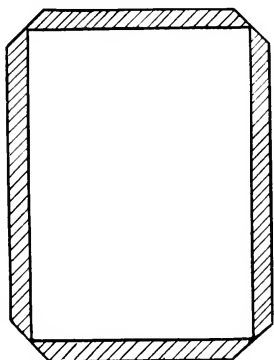


Fig 268

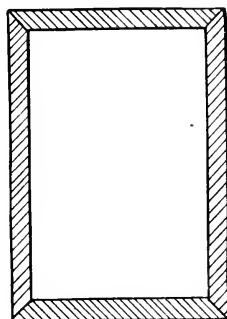


Fig 269

Then cut a piece of cover-paper 1" longer and 1" wider than the foundation which is to form the top cover. Place the foundation on the cover-paper, and mark around it in lead pencil. Removing it, cut off the corners of the cover-paper as shown in Figure 268. This will make them fit as a miter on the corners when folded over. Grease the paper on the pencil lines and then insert the strawboard. Paste (a formula is given in the chapter on Miscellaneous Paper Sloyd) by applying the paste to the narrow parts that fold over (Figure 269). It requires considerable skill to cover the foundation with paste. If that is insisted upon, the best result is usually obtained by first brushing over the surface lightly with water so as to have it moist before applying the paste. If this is not done, the part on which the paste is first applied will be dried up before the entire surface is coated.

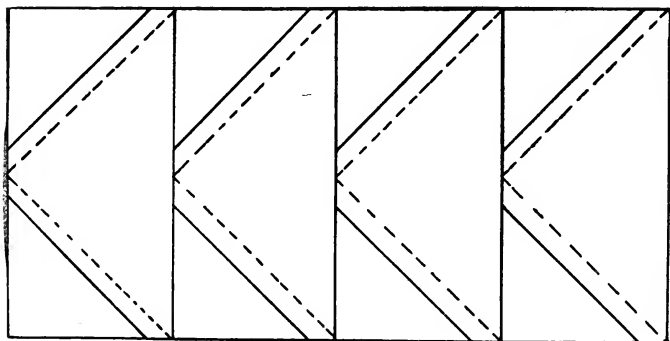


Fig 270

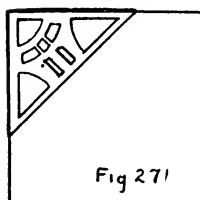


Fig 271

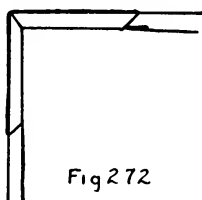


Fig 272

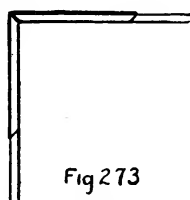


Fig 273

One of the corners should now be drawn full size. These are to be made of book-cloth or some paper that is quite strong and will not tear easily, since most of the wear and tear comes on the corners. Figure 270 shows the method of cutting the four corners advantageously from one strip of material. Cut a pattern for the decoration, and trace it on each of the four corners before pasting them. The corners should then have paste applied to the flaps, and, placing the corners with the part that has the decoration on it on the side that has already been covered, pasted. The top side is shown in Figure 271. The corner must not be drawn down too tightly or the

blotter cannot be inserted under it. Figure 272 shows the back or under side of the pad after the addition of the corner.

The next step is the cutting of a cover for the back of the pad. Cut a piece of cover paper $\frac{1}{4}$ " shorter and narrower than the pad itself. This is pasted by applying paste around the edge only. After placing it in position, the back of the pad will look like Figure 273, the space being left, since the back cover is made smaller, making a neater piece of work.

A blotter is inserted to complete the pad. It should be cut $\frac{3}{8}$ " shorter and $\frac{3}{8}$ " narrower than the pad itself.

2. PORTFOLIOS.

Portfolios may be made as started in Figure 274, the corners being pasted down tight on the bottom side or omitted entirely. The two pieces of foundation board placed on the cover paper are to be joined by means of a hinge.

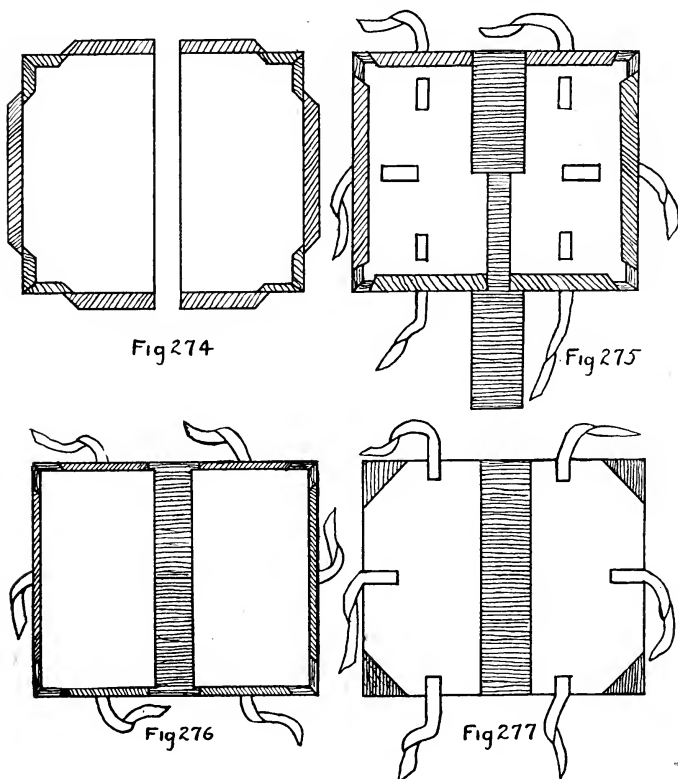
Figure 275 shows the outside covers pasted to the foundation board. A strip of book-cloth or very strong paper is cut to form the hinge. It must be twice the length of the finished book. Paste on the outside first, and then bring the ends over to the inside, so that they will meet in the center. The hinge in Figure 275 has been pasted on the back, and one end on the inside coming to the center.

The tapes are added (Figure 275) by taking a sharp knife and cutting thru both foundation board and cover. Push the end of the tape thru from the

outside to the inside of the folio, and paste the short end to the foundation. After the addition of the inside cover the tapes are firm and will not slip or pull out.

Paste the other end of the hinge and add the inside covers, and we have Figure 276. This completes the portfolio.

The outside of the folio is shown in Figure 277.



3. A SIMPLE BOOKLET.

Booklets are always in demand and can be made in various forms and sizes.

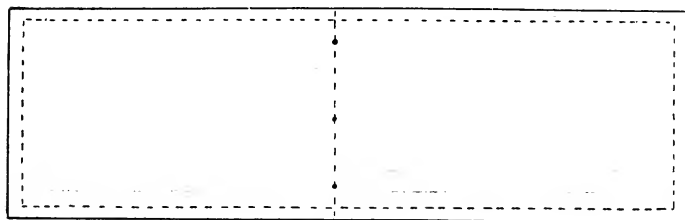


Fig 278

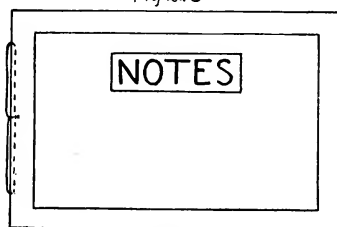


Fig 279

Both the cover and the sheet, making two leaves, are represented in Figure 278 with holes pierced for tying together. The solid oblong with a dotted line across the center is the cover. The dotted oblong shows the position that the leaves will assume. The cover when closed, with the leaves inside, is represented in Figure 279. The dotted and solid lines at the hinge show a good method of securing the leaves to the cover. Three holes are pierced as shown in Figure 278. With a needle pass the thread thru the upper hole from the outside. Then pass down on the inside and out thru the bottom hole. Then pass both ends in at the

central hole and tie around the cord, cutting the ends off close to the knot. A simple execution for the cover design is done in outline and in black. Consult the chapter on design for additional suggestions in designing the covers.

4. ANOTHER BOOK.

Figure 280 shows the two foundation boards placed on one large piece of book-cloth which forms

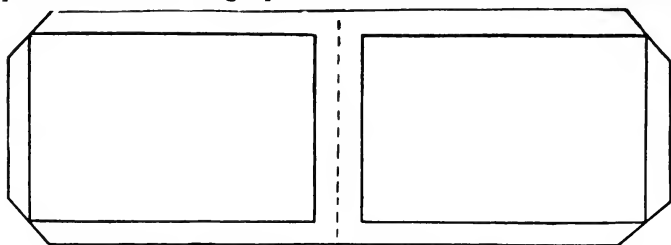


Fig 280

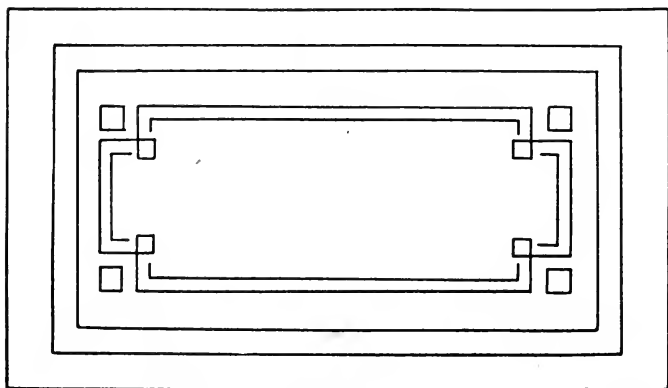


Fig 281

both outside covers and hinge. It is pasted to the foundation in the same manner as in the previous exercises.

The inside covers may be made of one piece; but, as a rule, the leaves are pasted in first, and then the inside cover, thus covering each side of the leaves where they are hinged. Method of working up leaves may be obtained from Section 6 of this chapter.

A cover design that may be given to a class having in it the possibility of a number of different solutions is found in Figure 281. It may be done in solid or outline.

5. LOOSE-LEAF BOOKS.

Loose-leaf books are desirable both as notebooks and books for mounting pictures, also for schoolwork. They are easily constructed, and additional pages may be added at will.

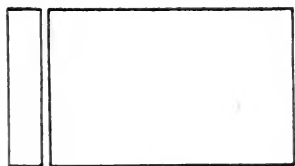


Fig 282

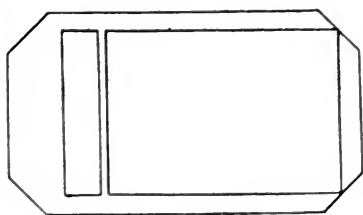


Fig 283

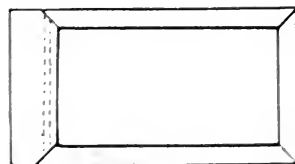


Fig 284



Fig 285

Two foundation pieces (Figure 282) are needed for each cover—a narrow one for piercing and hinging, and the wider one for the cover proper.

Book-cloth is best for the outside cover, but paper may be used if necessary. The foundation pieces are in position on the cover in Figure 283. Notice that the left-hand end projects farther than does the right-hand end. This is done so that it will fold far enough over on the inside in order to paste to the large foundation piece, Figure 284 making a stronger hinge than if it were folded like the other edges, and the inside-cover paper forming the hinge on this side. Paste in the inside cover, and, making another piece like the one just completed, the holes may be punched, eyelets inserted and the cover design transferred.

Figure 285 shows the cover design and the holes punched. The dotted lines represent the space forming the hinge. Be sure there is a space, and do not have the foundation pieces touching each other. At least $\frac{1}{8}$ " should be left.

If no eyelet punch is to be had, punch the holes and, placing the eyelets in them, clinch by means of a round-head screw. Take a round-head screw $\frac{3}{4}$ " long and gauge No. 7 or 8, and file the point blunt so that it can be struck with the hammer. Place the cover with the eyelet so that the eyelet will rest on a solid block of wood or a piece of iron, and, placing the head of the screw on the eyelet, strike the screw which clinches the eyelet. Then finish up smoothly by striking the eyelet lightly with the hammer.

6. ART-BOOKS.

Several plans for the contents of the art-books are possible. A certain number of pictures may be chosen to be studied in each grade; say one for each month. Then some of the important statements concerning the pictures could be written on the same or following pages. This demands a book to which leaves can be added when needed. The loose-leaf covers also meet this requirement.

The Perry pictures are recommended, since they are so inexpensive.

Even tho no appropriation is available for purchasing pictures, the teacher will find it worth while purchasing them the first month. After that the children will gladly provide one cent each per month in order to get a new picture if the first one has been made interesting.

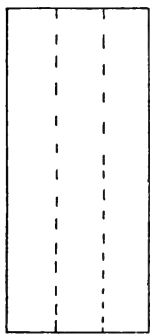


Fig 286



Fig 287

The covers for the art-books are made the same as the preceding covers, except that the inside covers are not added until the following has been inserted.

To make these stubs to which the pages are to be pasted, book-cloth or some strong cloth of light weight is needed.

Cut a piece like Figure 286. The space between the dotted lines is for sewing in the folded strips that have been prepared by cutting strips 1" wide and of the same length as Figure 286, and folded in the center. Take as many strips as you wish leaves in the book, and sew in place between the dotted lines. After sewing they will look like Figure 287.

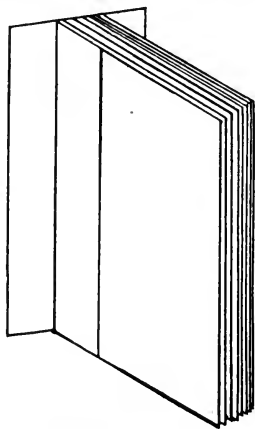


Fig 288

A sheet of construction paper is then pasted between each of the folded strips forming the leaves (Figure 288), and they are ready to be inserted in the covers. Paste the strips on either side of the leaves to the foundation pieces in the covers. Next cut a piece of cover paper twice the size of the inside cover. Paste one for the cover and the other becomes the flyleaf of the book.

X.

BASKETRY.

Basketry is a very desirable form of industrial work. It is of such a nature that it offers considerable resistance to the worker, thus developing a great deal of dexterity where any large amount of basketry is done. Children in grades lower than the third or fourth should be given only the simplest kinds of basketry. Often it is not advisable to begin even that early.

Materials used are reed, both round and flat, raffia, and such natural materials as willows, corn husks, grasses, pine needles, straw, etc.

Reed is split from the inner portion of rattan and dressed to cylindrical form in various sizes, numbering from 1 up. Those most adaptable for work in basketry are Nos. 1 to 6. Flat reed is obtained in the same manner.

Raffia has been described in the chapter on raffia.

Natural materials must be gathered by the person who is to use them. Experience, tho a costly teacher, is the one that must be relied upon most in gathering them. In gathering the corn husks use only the inner and softer ones. Pine needles may be used either green or dry. Of the straws, the ones with the long spaces between the nodes (joints) are best for braiding. Some grasses are gathered at one season and some at another. Cutting at the wrong time causes them to become brittle with age. The

proper time for cutting willows is given under the heading "Willow Baskets."

Tools.—Only a few simple tools are necessary. One can get along admirably with a sharp knife and a ruler. If some tool is needed to make an opening for the ends of spokes, one can be made by shaving a stick of hard wood to a long point. Heavy shears are useful when cutting up large quantities of material for class use. Pliers can also be used at times, but are not absolutely necessary.

If no utensil is at hand for soaking raffia, get a lard-can, which is just the size and depth needed, and can be bought cheaply.

1. REED MATS.

As an introduction to the successful making of reed baskets, the making of reed mats is a most desirable one. In fact, the mastery of this insures success in the making of baskets; but, without this, the result will not be satisfactory, since we must have a good start before we can consider the subject of form.

Materials needed for the first mat are: Four spokes of No. 3 reed 12" long, one spoke of No. 3 reed 7" long, and two weavers of No. 2 reed.

The reed should be placed in cold water and permitted to soak for at least an hour before using. If hot water is used, only half the length of time is necessary. Proceed by arranging the 12" spokes in pairs and crossing them in the center. Place the

short spoke between any two of the long ones, and hold all in place with the left hand. Now take one of the weavers and begin weaving by placing the end of it parallel and against one of the spokes, with the end slightly to the right of where the spokes cross. Pass it on around the spokes that it crosses, and as it comes up cross the other set of spokes and down again, passing below the spokes you first went around. A in Figure 289 is the weaver, and the other reeds represented are the spokes.

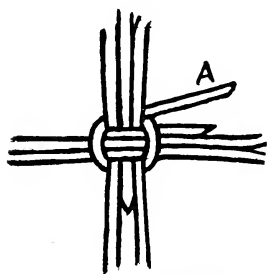


Fig.289

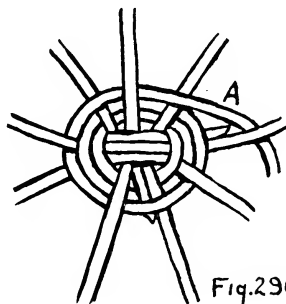


Fig.290

Now, as you come up and over the next set, you have made one circuit. Follow the same path once or twice around, and then, beginning with the spokes at the end of the circuit, separate the spokes, and continue by passing the weaver over one, under one, etc., dividing the spokes evenly as soon as possible. A in Figure 290 is the same as A in Figure 289. Great care should be exercised in *pressing* the weaver down, between each spoke, close to the previous row of weaving. This alone is not sufficient, it should also be held in position with the forefinger of the left hand

while passing to each succeeding spoke. The importance of this is never fully realized until the student begins work on his mat or basket. This applies to all reedwork.

In starting a new weaver place the end on the end of the old weaver behind a spoke, and continue in the same path that the old weaver would have taken. Later, when the project is completed, the ends will be cut evenly, leaving no obstruction. Your judgement will of course tell you that this splicing must take place on the inside. (The outside of the mat or basket is the side next to the worker.)

When the mat is about 4" in diameter, the end of the weaver is passed under the last row of weaving and behind the next spoke, or it may be bound off by passing the weaver under the last row of weaving, under the next spoke, over the next, and under the last row of weaving again. Continue in this manner once around the mat. The mat is now ready for the border.

The simplest open border (Figure 291) is made by cutting the spokes to an even length and shaving them to a point, soaking the mat and then bending spoke No. 1, and pushing it down beside spoke No. 2, and continuing in this way until all of the spokes are pushed down. Figure 292 might have been used on this mat. Referring to the figure you will see the similarity between this and the other border. The spokes should be pushed down to a depth of at least 1" into the mat.

Figure 293 shows the first step in the detail of the heavy border which may be used on mats, and is specially desirable for baskets whose tops are exposed to hard usage.

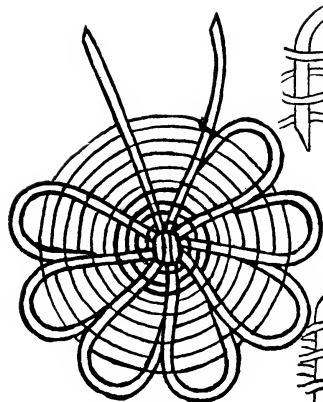


Fig 291

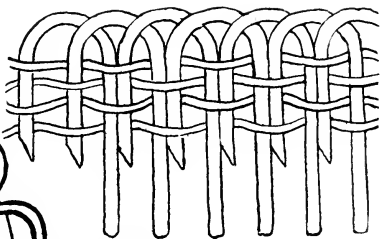


Fig 292

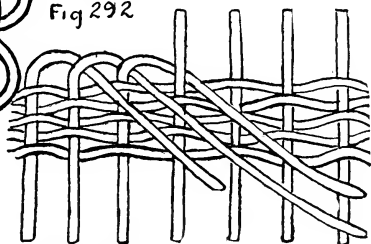


Fig 293

To execute the border started in Figure 293 arrange the spokes just as they are shown, then proceed by taking the end of the first spoke which is already bent around the second, carry it forward in front of the third and fourth, back of the fifth, and push it down on the right-hand side of this, the fifth spoke, and bend, and then push down the fourth spoke. This makes two bent spokes between the fifth and sixth, a short one and a long one (Figure 294). Continue in this way and you will find that you will also have two between all succeeding spokes. The long one, of course, is to be used again, and the short one remains where it is, and is cut off after the border is completed.

A *second reed* mat is executed, since, frequently, there is a demand for basketry low down in the grades

where the children are too young to work in accordance with the preceding reed mat. Splitting the spokes and threading them for the base, and then beginning to weave with raffia, is an easier and less technical beginning, but does not give as serviceable a basket. We shall also use more spokes in this mat, and it will be seen that the result is a closer border, which is stronger and more durable.

Materials used are six spokes of No. 3 reed 12" long; one spoke of No. 3 reed 7" long, one weaver of No. 1 reed, and one or two strands of raffia.

Cut one end of three of the long spokes and of the short one to a short flat point. Next take a knife and make a slit in the center of the other three. (See Figure 295.)

Next take the three pointed spokes and slip them thru this opening until half projects on either side. After one has been slipped thru, it is an easy matter to slip in the other two, one on either side. The short one can then be slipped in between two of the longer ones, leaving the blunt end to project but slightly beyond the ones that are slitted, as shown in Figure 296.

Begin weaving by taking the large end of a strand of raffia (raffia should never be soaked in water to make it pliable in order to manipulate more easily), and start just as we did with the reed weaver in Figure 289. In this case we begin weaving over and under after the first time around. If you have followed instructions you are now weaving from left to right, pulling the weaver down close to the center and holding it each time with the left forefinger to prevent

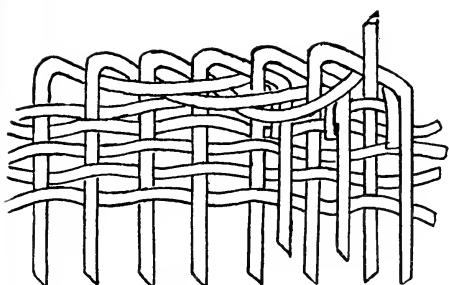


Fig 294



Fig 295

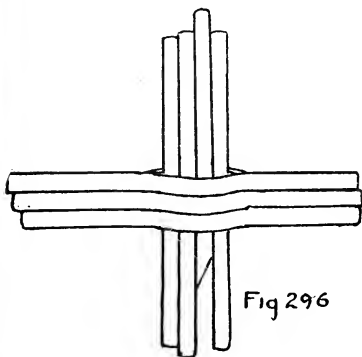


Fig 296

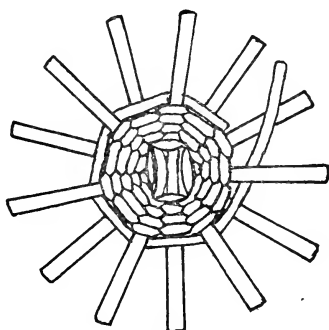


Fig 297

slipping. Do not overdo this part, however, by having your weaver so tight that the bottom will not remain flat.

The spokes must be evenly separated by the time three or four rows have been woven in order that the spokes come out straight from the center, otherwise the work will not be symmetrical.

After one or two of the strands of raffia have been used, insert a weaver of No. 1 reed behind a spoke,

and continue the weaving, keeping the raffia with the reed weaver until you come to the end of the raffia (Figure 297). The end of the reed weaver must be held, to prevent its slipping, until one row has been woven, when it will bind and remain in place without holding. A full-length weaver will make this mat large enough. When the mat is finished, the weaver is fastened in the same manner as the one in the preceding mat. If this is the second mat that has been made, it is well to use the heavy border in order to have more than one with which you are familiar.

2. HOW TO UTILIZE MATS.

It is sometimes necessary to make several mats in order to acquire enough technique to proceed with the baskets. So, in order to stimulate the child to repeat the problem, the second one that he makes should not be simply a mat, but rather one in disguise.

Pincushion.—The making of a small mat with rather a large border affords excellent material for a pincushion. (Figure 298.)

Cut a circular piece of cardboard, about 2" in diameter. Place some wadding or other filling on this, and fasten to the cardboard by taking a few stitches. Cover with a circle of suitable material of double the diameter of the cardboard circle. To cover, gather the edge rather coarsely with thread, place on this the cardboard with padding turned downward, and draw up tightly, and secure the ends of the thread. Then sew the pincushion on the center of the mat.

Figure 298 is intended to be used flat on the table, but could be made more attractive to smaller children by weaving a ribbon around the open border decorating with two or three bows. Then suspend the cushion by means of two ribbons with a bow at the top.

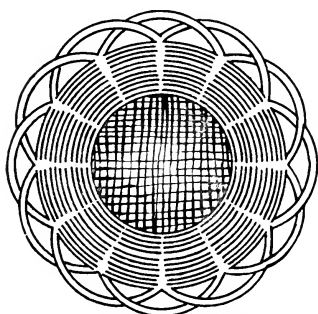


Fig 298

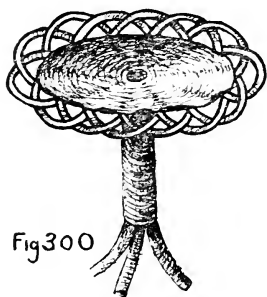


Fig 300

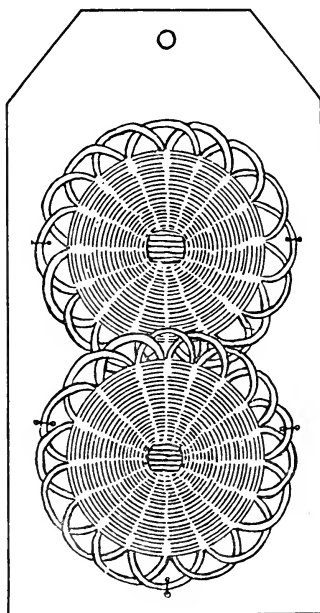


Fig 299

Letter-Rack.—Two or more mats are used for this project. Figure 299 is almost self-explanatory. For the back take a board $\frac{3}{8}$ " thick, about 8" wide and 12" long (depending on the size of the mats). It can be shaped at the top by means of a jack-knife.

Place the mats on the back, and with a pencil locate the points for fastening. If no drill is at hand for making the small holes, a nail may be driven thru and pulled out again. If a board cannot be used, cover a piece of cardboard, or the cardboard can be used without covering, providing it is of a desirable color and shade.

Doll-Table—The spokes in the mat for the doll-table should be cut much longer than would ordinarily be used in making a mat the diameter of which is the same as the one in Figure 300; $2\frac{1}{2}$ " is an appropriate diameter. Weave the top just the same as you do for any other mat, using raffia weavers and making an open border. But in pushing back the spokes, which are quite long in this case, let them go as far as the center of the mat, and then draw them out to form the support for the table. Now take these weavers and bind them with raffia, covering them so that the reed will not show. When within about $\frac{3}{4}$ " of the distance from the top of the table to the floor, divide them into three even groups and wrap separately, forming the feet of the support as shown in Figure 300.

This is a doll-table, and must not be confused with a full-sized table in criticizing the proportions of Figures 298, 299 and 300.

Other articles of doll furniture can be worked out on the same plan, the chair being one of the simpler ones.

A large number of projects could be worked out here in case there should be a need for them, the whisk-broom holder being one of the popular ones; but, since this is not merely a text on basketry, we must

resist the temptation of treating mats farther. The author feels justified in having treated this somewhat at length, since, as has been stated, successful basketry depends on a good beginning at the center of the basket.

3. REED BASKETS.

The construction of any project should always be preceded by a working drawing whenever possible. For a reed basket an outline drawing, showing the shape, diameter and height, is all that is necessary. (See Figure 301.)

For the first attempt the diameter should not be more than 3". In making the drawing you must consider that you have a front view, or the real height of the basket, and not a perspective view, which includes not only the height, but a part of the diameter. For the length of the long spokes add 8" to the length actually needed for the bottom and sides of the basket, in order that there will be 4" of each spoke for the border of the basket. The short spoke should be a little more than half the length of the others. This, after binding at the center, will give you seventeen spokes radiating from the center. As a rule, it is not advisable to use fewer spokes than sixteen. In case the basket is too small for so large a number of spokes, they can be used in pairs.

The basket is started just like either of the mats. As soon as you think you have woven to the diameter of your basket, stop and measure it. In measuring do not use a ruler, but fold your working drawing on the base line as indicated by the dotted

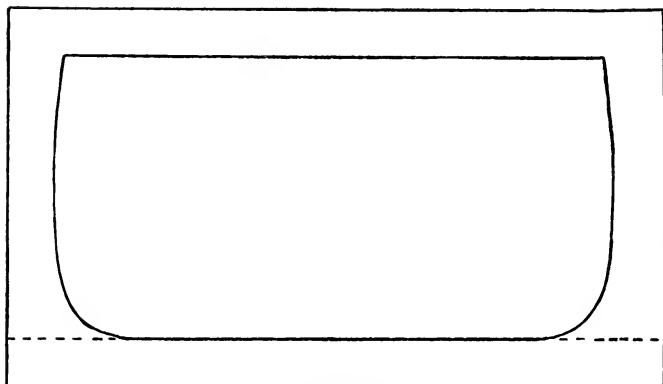


Fig 301

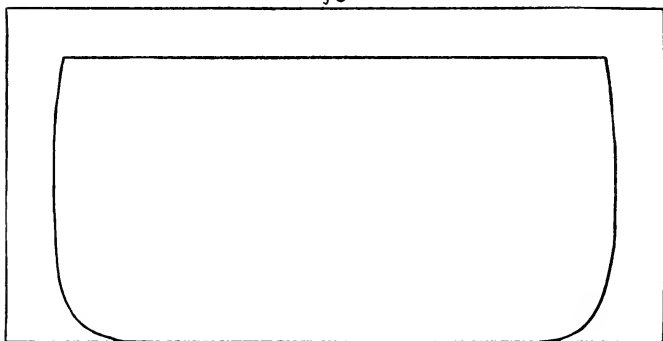


Fig 302

line in Figure 301, giving Figure 302. Now you can use the drawing for measuring the diameter.

If you find that the base is large enough, place it in water again to make the spokes quite pliable. Now bend them so that they appear to conform to the shape of your drawing. Resume the weaving, drawing the weaver just tight enough to keep the spokes in position. After you have gone around

several times, hold your drawing back of the basket, and by sighting you judge accurately as to whether or not you are weaving in accordance with the drawing. Should you find the drawing quite wrong in shape, it might be necessary to take off part of the weaver and weave it again, making it more or less tight as may be found necessary.

After weaving to the desired height, fasten the end of the weaver the same as in the mat. For this basket a simple open border is preferable (Figure 291).



Plate No. 5.

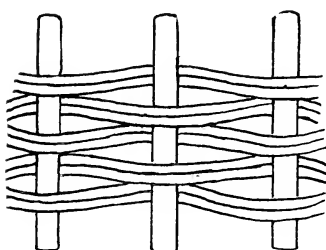


Fig 303

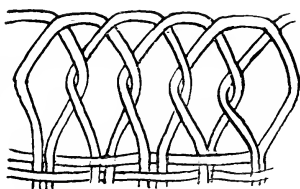


Fig 307

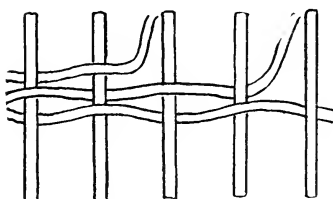


Fig 304

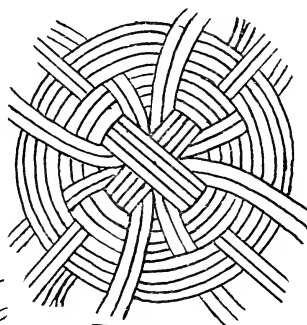


Fig 308

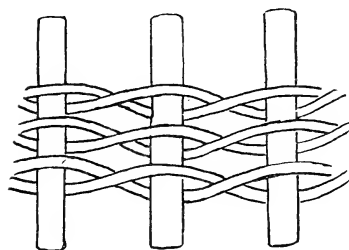


Fig 305

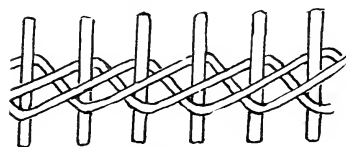


Fig 306

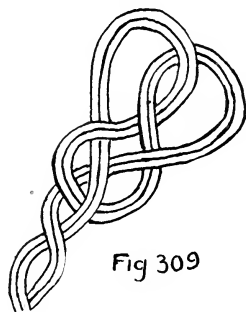


Fig 309

Nearly all reed baskets are woven in about the same manner, so that it is not necessary to describe the process of making additional ones.

A variety of designs is desirable. For that reason Figures 303 to 307 were prepared. This was done in preference to inserting expensive halftones that show beautiful objects completed, but without sufficient detail to learn the construction.

Figure 303 illustrates double-weaving. It is the same as single-weaving (Figure 290) except that two weavers are used as one.

Figure 304 illustrates two weavers, one following the other. This produces the same effect as single weavers, but requires an even number of spokes.

Figure 305 illustrates pairing. Two weavers are started, one behind each succeeding spoke, and crossed between them, bringing forward the under weaver each time. This weave can be used for a border, and makes an attractive band for reed basket. Either an even or an odd number of spokes may be used. Figure 306 illustrates the triple twist. Three weavers are started, one behind each succeeding spoke, beginning to weave by taking the one started first and bringing it forward over the two other weavers and behind the third spoke; next, take the second spoke, bringing it forward over two, etc.

This makes a better border or top than does Figure 305, since it is closer and covers the spoke. The triple twist may also be used over broken spokes in order to keep them from showing.

Figure 307 illustrates another open border or top which makes an attractive finish.

Figure 309 shows a method of making a handle to be used on hanging-baskets and the like, to be fastened to the outside of the basket with some very fine reed.

Figure 308 shows the beginning of a large basket of sixteen long spokes, or thirty-two, radiating from the center. After separating into groups of four, mark their centers, and then place the first group on the desk or table, the second group on this, and at right angles to them, with the other two groups diagonally across these. Start a weaver, one soaked until quite pliable, by placing the end on top of the group of spokes to the left of the one that was placed on the table first, passing under the group which was placed there first, over the next, and so on until you have not one weave, but three or four. Now continue by dividing the spokes into groups of two. The weaver must decide now upon the kind of weave he will use for finishing. If it is to be a rather large basket, he can continue for several weaves, and then separate the spokes, using them singly. Then it becomes necessary to use either double, paired or some other weaving that uses an even number of spokes, or one spoke may be cut, thus leaving an odd number. The method of some Indians when using an even number of spokes is to pass the weaver under two spokes or two groups of spokes in order to start a new row.

4. WILLOW BASKETS.

Some schools, especially those in the rural districts, are unable to carry on basketry, because of a lack of funds with which to purchase the reed. In many localities, however, the common willow grows profusely and may be used to advantage. To some pupils it appeals more than does the reedwork, since the fact that you have gathered the material yourself adds charm to the work.

Willows should be cut after they have stopped growing in the autumn; in the spring, just before the sap comes, is a good time. Choose only the choice sprouts that have no branches and have rather a uniform thickness.

They may be used for coiled baskets, described farther on in this chapter, without removing the bark. But if they are not to be covered it is best to peel them by boiling until the bark can readily be slipped off by crushing. Never scrape them, as this destroys the smooth polished surface. To simplify peeling, split a large willow that has not been boiled, slip the larger end of the willows into the opening, holding the peeler and drawing the steamed willow thru, which removes the bark quite readily.

When weaving be sure that they are pliable, and manipulate in the same manner as the reed.

Ash splints are also used to advantage.

5. COILED BASKETS.

Coiled baskets, to be successful, require a bottom accurately made. If no reed baskets have been made,

it is well to make one or two mats before starting on baskets. Two kinds of coiled baskets will be considered—soft-coiled and hard-coiled. A soft-coiled basket is one in which the foundation consists of raffia, grasses, corn-husks, or some other soft material, and which is wrapped or covered with raffia. A hard-coiled basket is one whose foundation material is reed or willow.

Soft-coiled baskets will be made first.

A definite idea of such a basket as we are about to undertake may be had from Plate 5. These are hard-coiled baskets. The soft-coiled ones appear nearly the same at a distance, except that they are just a trifle clumsy, being due to the fact that a thicker coil is necessary. The first one will be a plain basket without any design. After making a working drawing for a basket of, say, 4" in diameter and of a proportionate height, we are ready for material.

Begin with just a few strands of the foundation material. If raffia is used, take several strands so that the beginning of the coil may be small, making it pliable and lending itself to a circular shape. Thread a raffia needle with a strand of raffia, and wrap as in Figure 310, covering it so that no parts of it show thru. Now begin coiling it (Figure 311), and sewing to keep it in position. Add to your foundation until it makes a coil at least $\frac{1}{4}$ " in diameter after wrapping, and continue to add a few strands at a time as you wrap, in order that the coil remains of a uniform size. Coil until the bottom is of the required diameter, testing as we did with Figure 302 in the reed basket.



Fig 310

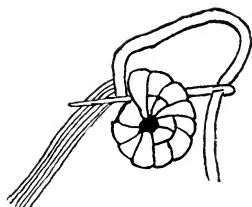


Fig 311

Begin shaping the sides by raising the coil up slightly on the one below and sewing in place. Continue in this way, causing the sides to conform to the drawing as we did in the reed basket. If the basket is smaller at the top, the coil is set in just a little toward the center as you sew. Just before we have it to the required height make the coil gradually thinner until it comes to a point, as we had it in the beginning of the basket. Fasten the end of the raffia securely and cut off close to the coil. If necessary, take a very small thread of raffia which has been split from a larger strand, and fasten the ends more securely.

Using colored raffia for sewing adds variety to the basket just described. Two designs may be executed and different stitches used in the soft-coiled baskets similar to the ones undertaken in the hard-coiled baskets.

6. HARD-COILED BASKETS.

This process is similar to the soft-coiled process. Several different stitches will be described.

No. 4 reed is most desirable for ordinary-size baskets, but No. 3 and No. 5 are quite satisfactory.

The reed should be soaked until quite pliable. After winding all into a small circle with the exception of a few inches, tie the coil in several places in order that it may set in a circular form and work better.

Begin back 3" from the end of the reed, and cut to a long flat point as shown in Figure 312, A and B. A shows the top view of the reed, and B the side view after it has been cut. If this reed has been properly pointed, it is possible to begin wrapping without leaving an opening in the center of the bottom. Thread the needle, and wrap, beginning at the end of the reed (Figure 313). Wrap for $1\frac{1}{2}$ ", and then roll or coil what has been wrapped into the smallest possible coil.

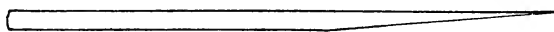


Fig 312 A

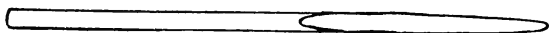


Fig 312 B

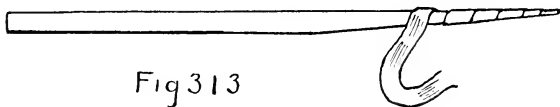


Fig 313

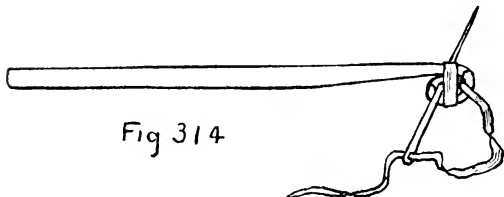
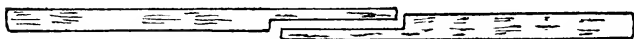


Fig 314

Begin stitching, and bind securely before coiling farther (Figure 314). Since the natural raffia in the needle is of the same color as that used for wrapping in the beginning, it is possible to stitch the immediate center with whatever stitch seems to be convenient.

After the bottom is started, some stitch must be decided upon and continued thruout the bottom; then, if it is desirable, another stitch may be used for the sides, finishing off the top by cutting to a long flat point before covering.

*Fig 315 A**Fig 315 B*

Either of the methods, A or B in Figure 315, may be used in splicing. It is necessary to shave the reeds for joining before coming to the place of splicing, being careful that they fit, and make a joint of the same size as the reed itself. The two reeds should be held carefully together as you work over the splicing. Sometimes it may be necessary to wrap the splice with a fine piece of raffia, and also sew thru it a few times to keep it from pulling apart.

Threads are spliced by covering the end of the one just used up and wrapping securely with the new thread. Cut the ends off afterwards if any remain.

Several stitches that are desirable for school use and the amateur craftsman will now be described and illustrated:

The lazy-squaw stitch (Figure 316) is a very simple stitch and easily executed. A solid foundation is best on which to use this stitch, as the coil is wound but once between the stitches. The threads used in sewing should be of an even size, which adds to the beauty of the basket.

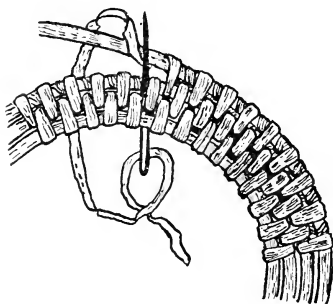


Fig 316

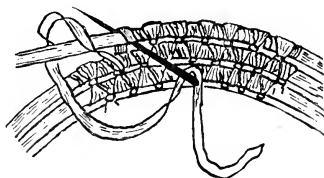


Fig 317

The hand-stitch (Figure 317) can be used on both soft-coiled and hard-coiled baskets with equal success.

The student will be able to work out new stitches for himself if he has mastered the ones given here. Those wishing to go deeper into the subject of basketry should learn the Navaho and the Pomo stitches.

Designs are treated under a separate heading, since they are applicable to both hard-coiled and soft-coiled baskets.

Some authors advise the application of a design after the basket is completed. This is a rather crude method. A basket neatly made without a design is preferable. Easy Dyes on tilo strands come nearest being successful along this line.

Colored raffia used in the weaving to work out the

design adds to the beauty of the basket. Coloring of raffia is described in the chapter on raffia.

The design should be worked out in full-size units in terms of the circumference of the basket. A full-size front view, with the units in a straight line, is represented in Figure 318. Two spaces between the parallel lines drawn horizontally represent the diameter of the foundation after wrapping.

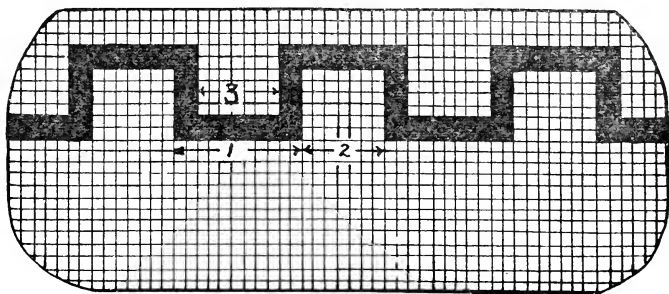


Fig 318

Weave the same as a basket without design until you come to the row for the first of the colored raffia (1 in Figure 318). Add the color, fastening it the same as you would a new strand of raffia, and carry the natural one along with the reed until you come to the limit of 1, which is the same as the beginning of 2; now use the natural strand, carrying the colored one along with the reed until the limit of 2 is reached and the colored raffia used again. Continue in this way until you have gone once around the basket. Here it can be seen what was meant by working out the full-sized unit in terms of the circumference, since, otherwise, it would be a mere accident if we came out evenly.

Begin again with the colored raffia, directly above the place where you started the first time, but weave only to the beginning of 3, using the natural for 3. Continue in this way until the design is finished; then add two rows of natural, and the basket is completed.

For the first basket, using a design, it is advisable to use only a border in order to learn just how to proceed.

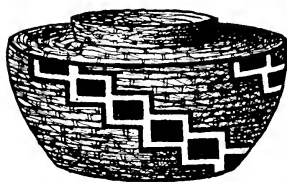
Pen sketches of several baskets are now given in order to give the student a working basis for more baskets. Naturally, the various Indian baskets influence us very largely in both design and weaving. Figures 319 to 324 are the sketches.



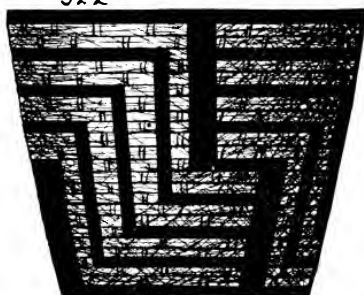
Figs 319



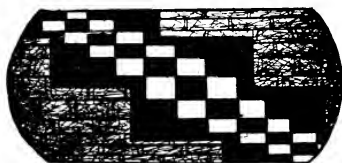
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7. BASKETS OF NATURAL MATERIAL.

Pine-needles make excellent pintrays and small baskets. Small baskets with covers may be made to be used as jewel-cases.

Rye, wheat and oat straw, as well as the different grasses and rushes that are available, may be used, not merely for the small baskets, but for larger work.

Corn-husks can be used the same as the foundation work, but are used to better advantage if braided and then sewed together.

Figure 325 shows the start of a pine-needle, straw or grass basket, using a thread or strand of raffia for binding. Figure 326 is another section of the same basket.

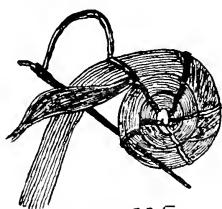


Fig 325

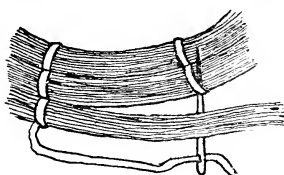
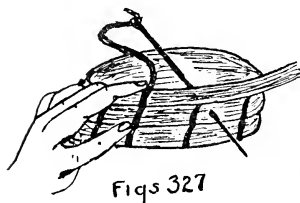
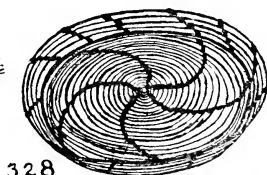


Fig 326



Figs 327



328

In working, the grass should be held in the left hand, with the first finger free to keep the thread from

slipping back and causing the work to become loose and flimsy (Figure 327). Stitch thru the coil each time, and under the stitch in the last coil. Place the thread at the proper angle each time before drawing tight, so that the spirals will be regular. It is not advisable to have them very close together, however. If necessary, new ones may be added by starting one in the center of each space.

The foregoing applies to an open basket; *i. e.*, one where the inside is the right side. A closed basket is one in which the sides incline toward the center at the top. When the bottom is of the desired size, turn the basket the opposite way, which also reverses the angle of the stitch and makes the opposite of the basket the right side. Figure 328 is a pine-needle basket in which the inside is the right side. This is called an "open basket," since the sides at the top flare away from the center instead of toward it.

What has been said here about baskets of natural material does not conflict with using them for coiled baskets with soft foundation, for in that case the foundation is wrapped and covered, but it is exposed in these baskets.

8. FLAT REED BASKETS.

Flat reed may be used for either square or oblong trays.

For an oblong tray, 3"x5", take eleven strips of reed $\frac{1}{4}$ " wide and $5\frac{1}{2}$ " long. Shave both ends of each strip to a thin point, beginning back $\frac{3}{4}$ " from the end. Cover each one of these strips with raffia, leaving

uncovered $\frac{1}{4}$ " at each end. Then sew to this the remaining ten strips, using the knot stitch (Figure 317). This will form the bottom of the tray shown started in Figure 330.

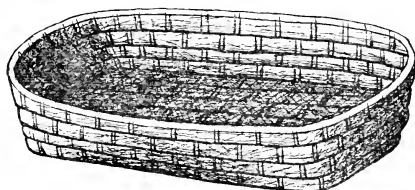


Fig 329

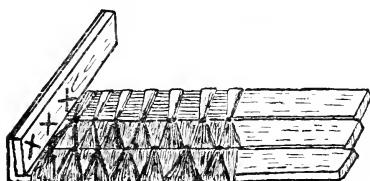


Fig 330

After the bottom is finished, cut two strips of reed exactly the length of the width of the bottom. Now moisten the $\frac{1}{4}$ " projections at either end until pliable, then bend until they form a right angle with the bottom, and fasten the strips on the inside of the tray by sewing with a very fine strand of split raffia as shown in Figure 330. For the sides cut three strips of reed $\frac{1}{2}$ " longer than the distance around the basket, so as to permit splicing. Soak these in order that they may not break while bending at the corners, or in sewing while splicing. To splice shave both ends, so that, when placed together, they will be of the same thick-

ness as that of the reed, and sew together by taking a few stitches with a finely-split strand of raffia. Take one of these, and, holding it in position, sew to the bottom, using the same stitch. Pass on the outside of the strips turned up at the ends, and sew over both, completely covering the ends of the eleven strips used in the bottom. Add the other two, being careful that the spliced places are not directly over each other, and the tray is complete.

Baskets may be made in the same way by cutting each succeeding strip for the sides a trifle longer, causing the basket to flare at the top.

Figure 329 is a tray slightly larger than the one just described, and has a double reed at the top.

XI.

DESIGN.

"The Greek worship or seeking was essentially of Rightness and Strength founded on Forethought. The principal character of Greek thought is not Beauty, but Design."---*Ruskin*.

The subject of design and color for manual training is such an inexhaustible one that we can deal with it only in a general way, but too much stress cannot be laid upon the art side of the handicraft work as it is taught in most of our schools.

While teaching the child to use his hands in response to his creative mind, we should not forget that it is just as easy to instill correct ideas of form, design and color as to allow a careless disregard of the things that mean beauty.

If the teacher has no idea of the great underlying principles of art, how can he expect to succeed in giving proper instruction in manual training? Art and manual training should almost be synonymous terms.

The teacher meets his first problem in the selection of material. For paper-work he must think not only of the use that is to be made of it, but of the colors that harmonize and are in contrast in dark and light of the same or different colors, as dark and light green, dark and light gray, or tan and brown, blue and orange, etc. When the child makes his selections, give hints enough to prevent discordant notes, and he will be

acquiring good taste in an unconscious way. In buying cord, consider the color also, and when raffia is purchased it is better to get it natural, and then dye it, than to purchase the ugly colors that one so often gets. Easy dyes are very satisfactory to use; and, by knowing a little about mixing colors, fine results may be obtained. For instance, the dark red is crude; but, by mixing green with it, one gets a soft old-rose color; and a little orange mixed with the blue gives a beautiful soft tone.

Burlap, which can be obtained from sacks or the wrapping of furniture, can be dyed in the bath following the raffia, as it absorbs all of the color that is left.

Teachers in the country who have no appropriation allowed for materials can use from nature's generous supply. If one needs yellow dye, let him use golden rod (the whole plant) or onion skins; sumach berries give a pink dye, and, when boiled with the leaves, plant and berries, tan is obtained; pokeberries and grapes give purple; hickory, walnut bark and shucks give brown; and the logwood gives black. If anyone needs red, buy a little cochineal, and indigo for blue. Get green by mixing the blues and yellows.

If in the fall the wideawake teacher collects materials and dries them two or three weeks in a dark room, he is ready for work, and needs only a little practice, good-will and the help of the larger pupils. He can have a full supply of cat-tails, flags, rushes, marsh-grass, seaweed, corn-husks, willows, oak-twigs, ash-splints, wild wistaria, palm-leaves, pine-needles, bamboo, and worlds of other things, to be used in basket-weaving, hat-making (from palmetto), etc.

The wise teacher can go to nature again for his ideas for applied design, but that is by far the most difficult phase of manual training, because the average teacher does not know the subject himself, and permits the pupils to make designs too hard or realistic and seldom suitable for the article to be decorated.

Let one remember that it is much better to have no design at all than to have a bad one, and, altho a child loves to decorate, he should be properly directed or made to avoid it. Right here let us say that the teacher must have abundant material to show the pupils as each new subject is introduced, not to be used as copies, but to be offered as suggestions for original work or for variations. Every child should have his problem stated clearly, examples shown, and certain restrictions put upon him before he is allowed to begin. If one has no way of obtaining inspiration thru contact with the work of the great artists or getting illustrations from an art library, let him own sets of good art-books that deal with design and are full of excellent examples. In designing any object you must consider the following:

Purpose of the object to be made.

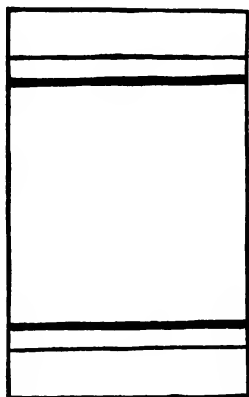
What form is best suited to its usefulness.

What material is used to the best advantage.

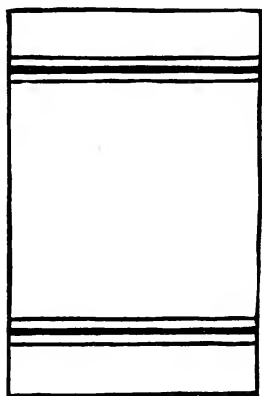
Is decoration necessary? If so, what kind?

In the teaching of design it is best to begin with the simplest problems of line arrangement, as are used on the ends of rugs (Figures 331 and 332), incised designs on pottery (Figure 333), border designs for baskets and for lamp-shades (Figure 357), etc. It can be carried into the more complicated problems, as the

interlaced patterns—the belt (Figure 344) and the book-cover (Figure 362), both suitable for leather-work, and the needle-book (Figure 346).



Figs 331



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Figs 337



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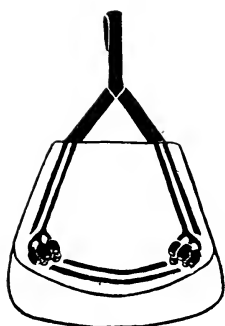


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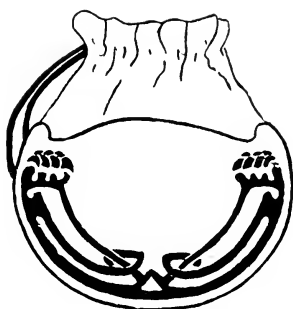
After a few designs have been put on the black-board let the child work out some on paper; then select his best, which he must perfect before he thinks of working it out in his basketry or whatever he is making.

Spotting or massing is a step beyond line composition, and it brings in a very important principle, that of balancing dark and light in tones of gray, or color. It is illustrated in the drawings under weaving. The designs for tooled-leather bags (Nos. 341 and 342), cardcase (No. 343), interlace (No. 345) coin-purse (No. 347) for a little child, the stenciling (Figures 358, 359 and 360), as well as the borders (Figures 337-340), that were designed by pupils, etc.

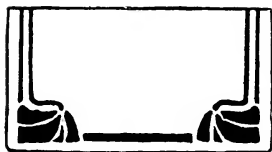
If one wants plant and animal forms for design, let him use them in a decorative or abstract way, and not in a purely naturalistic manner, for, while morning glories are lovely on the vine, they are not suitable for decorative purposes when drawn and colored just as they grow. We have had pupils make a drawing of a cat, and, by making it into a straight-line unit, a good border was made. (Figure 340 was made by a third-grade child.) The borders above it were derived from insects, the lamp-shade (No. 356) was taken from the violet, the block-prints, corners and rosettes (Figures 348-355) were taken from insects and flowers, the bags have berries as motifs, and the needle-book has the water-lily. The use of the square paper is often good, because it keeps the pupil away from dangerous curves, and if he applies himself properly he gets results that surprise everyone. Especially is this true in the planning of block-prints for printing that will now be discussed more fully.



Figs 341



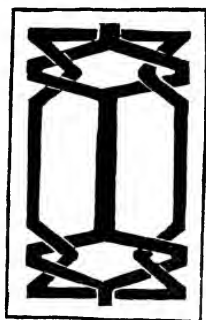
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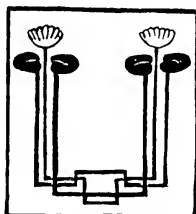
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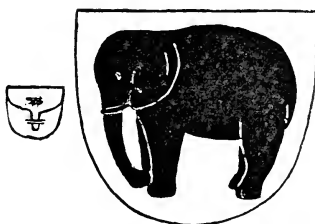
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Figs 348



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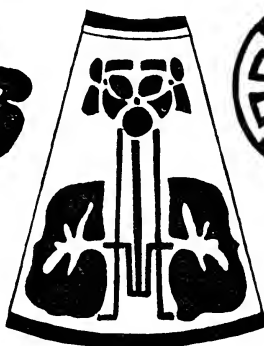
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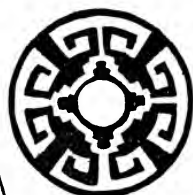
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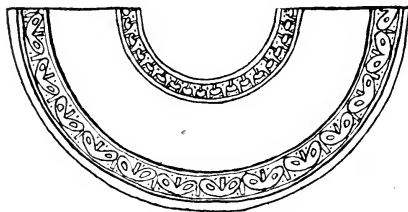
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357

1. BLOCK-PRINTING.

Block-printing is a very old art, used principally by the peoples of India, Japan and other countries, and within the last few years very extensively by Americans. The process is a very simple one, and helps very much in the study of design and color harmony. Have the child plan his design on paper, using flowers, animals, landscapes, insects or geometric spots as motifs (Figures 348-350). Corners (Figures 351-353) and the rosette (Figure 354) can be used on the block. Let him put the design on thin paper, and with impression paper transfer it to a cork, spool, or on a well-planed block of wood (preferably pear or cherry, as the grain is finer, altho bass and other wood will do). With a sharp knife cut on the lines of the design, and gouge out the background. The block is now ready for use.

In the lower grades the printing is done on paper with printer's ink. An easier way is to put pads of cheesecloth on a slate over which the ink has been poured. The block is pressed into this inked pad and then printed on the paper, care being taken to make light pencil marks where the block ends, so as to register for the next one.

Water-color is often used after glue or mucilage has been added to prevent its running. Nevertheless, we prefer the dye, not only because it is the best on paper, but because it also can be satisfactorily used for bags, pillows, book-covers and articles that do not need washing, and after a hot iron is passed over the finished product it holds the color well. However, if one is to block-print curtains or table-covers that are to be washed, oil-paints diluted with turpentine or gasoline are best.

Wallpaper borders for the walls, linoleum, matting, screens, etc., for the doll-house, boxes, posters, Christmas and Easter cards (often printed by the little children from blocks made by the older ones), are put on the paper with blocks either pressed on the ink or with color put on the blocks, using a brush. That is a good way for anyone, for, while it is proper to make a separate block for each color used, it is far easier to put the different colors on the same block so as not to risk poor registering.

Block-printing as well as stenciling is not only applied to paper, but to linen, silk, burlap and all kinds of cotton goods.

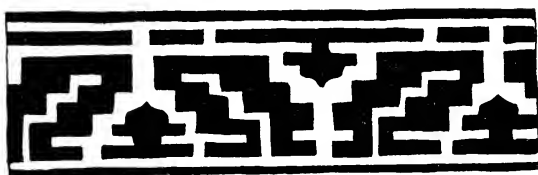
2. STENCILING.

This is another art taken principally from the Japanese, who have always been so proficient that it has been said that they cannot be excelled. Some of their ancient patterns are so delicate and wonderfully wrought that they resemble a spider's web, and, in fact, some have their finest lines made of the hair of the artists who produced them.

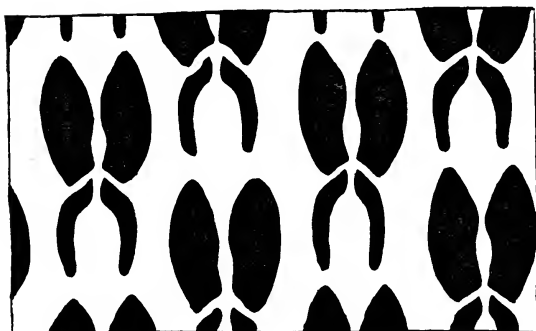
Like the block-printing, it has boomed of late, and is not only used on fabrics of all kinds, but also in interior decoration. A design must be made so that the parts can be separated and the background connected. See that there is a center of interest and not a number of uninteresting, discordant spots. Figure 358 can be used as either a surface pattern or as a border if used in two rows. No. 359 is a border taken from the acorn and oak-leaf. Figure 360 is a surface



Figs 358



359



360



Figs 361



Fig 362

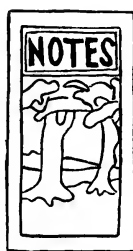


Fig 363

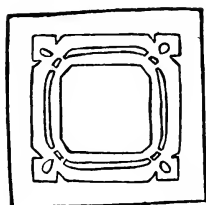


Fig 364

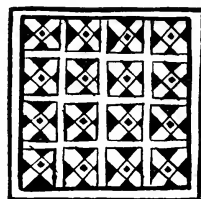


Fig 365

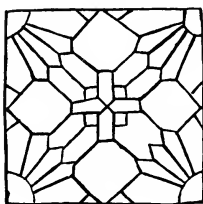


Fig 366

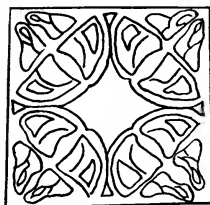


Fig 367

pattern. After the design is ready, transfer it to manila paper that has been shellacked on both sides to prevent it from tearing when paint is applied, and cut it out with a sharp knife held in a vertical position. Thumb-tack the stencil firmly over the cloth which is to be decorated, and, with a blotter under it to absorb surplus paint, apply the dye, water-color or paint by moving the brush up and down so as to prevent the color from slipping under the openings. This up-and-down motion is called "stippling." Use glue if the color runs, and avoid an overcharged brush. The bristles should be stiff. A muçilage brush answers the purpose quite well.

Both stenciling and block-printing are enhanced by the addition of embroidery, either with couching, as an outline finish, or a darning-stitch over the whole piece (Figure 365), and, if harmonizing colors are used, fine effects are obtained.

XII.

BIRD-HOUSES.

The building of a bird-house means that we wish to befriend the birds. It is not the purpose of this chapter to discuss fully the reason for encouraging birds, but to show in a brief way why it is well worth while for both boys and girls to protect them.

In the first place, some birds, as the robin, thrush, etc., will not nest in houses, and it is necessary to provide shrubbery. This leads to the planting of trees and shrubs, which may be utilized in teaching a love of nature and beauty.

Secondly, it teaches conservation. Even tho the birds were of no value, it would be worth while from the viewpoint of habit. How much more desirable it is to have children learn to practice conservation in preference to destruction.

Thirdly, and lastly, the constructiveness is well worth while. Another opportunity of teaching the fashioning of simple subjects in an artistic manner is here afforded. Good proportion and technique are too often lacking. Elaborate attempts in the way of designs too often lead to failure or a very crude product.

1. A WREN-HOUSE.

Wren-houses are, perhaps, the most universal ones. A simple, yet strong and durable, one is shown in Plate 6. The dimensions of this are for $\frac{3}{8}$ " material.

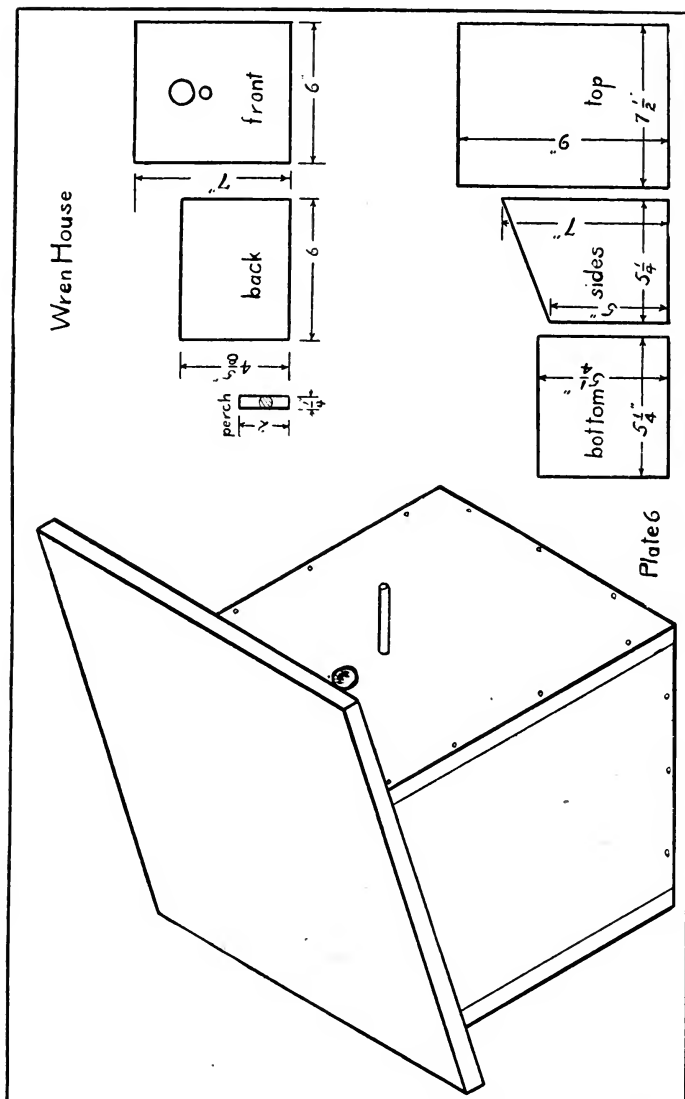
In schools where no shopwork is conducted, dry-goods boxes are a good source for material (both nails and lumber).

No previous instruction in woodwork is necessary. The pieces are shown in Plate 6, and each piece labeled and dimensioned. The most successful method, tho not quite as technical, is to cut a pattern for each part of the house. This will insure right angles at the corners where it is intended to have them. Any kind of paper will do. One corner should be started from in measuring, as paper bought already cut, either bound or unbound, can be relied upon to be square at the corners. After cutting the patterns, place them on the plank and mark around them. It will be necessary to mark two of the sides, but only one of each of the others.

After sawing all of the pieces, being careful to cut just to the lines, the holes should be bored in the front. The larger one is 1" in diameter, and the smaller one $\frac{1}{4}$ ". This smaller one is for the insertion of the perch. The perch in Plate 6 is a round stick $\frac{1}{4}$ " in diameter and 2" long. The circle with the lines across it in the drawing represents a cross-section, and the lines are called "cross-hatching."

The center for the larger hole is in the center of the board horizontally, and 2" down from the top. The smaller one is 1" below this. Be sure the large opening is not more than 1" in diameter; otherwise, the English sparrow will drive the wren from his home.

After the holes are bored, the parts are nailed together as shown in Plate 6. Nail the sides first, then slip the bottom in, and nail in place. In nailing on



the roof have $\frac{3}{4}$ " projecting over at each side and 2" in front. This will leave the necessary projection at the back of the house. Lastly, insert the perch in the smaller opening, and the house is complete.

The material may be $\frac{1}{4}$ " thick if desired. In that case the bottom would be $5\frac{1}{4}" \times 5\frac{1}{2}"$; the other pieces could be left the same.

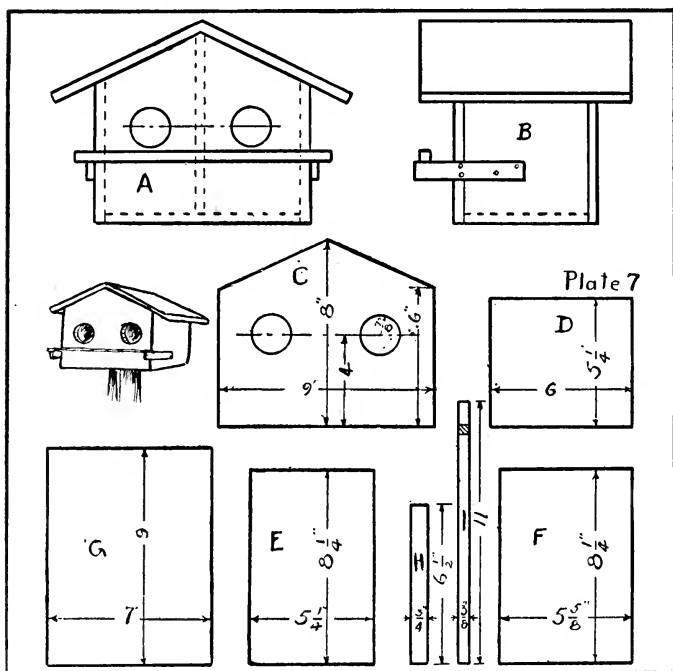
Painting these houses is not always desirable, and care should be exercised in choosing paint. Avoid the bright colors, and use green or gray, or slate if convenient. If the lumber is old or discolored, so that it does not look conspicuous, it is quite as well to omit the painting. This style of bird-house can be made larger and with more openings. Two rows of openings are sometimes desirable, and then a partition in the box, dividing it into two stories. A perch such as used in Plate 7 will be more desirable in that case. We sometimes see a shelf used for a perch. That is desirable for pigeons, but not for wrens, martins, blue-birds, etc.

2. A LARGER BIRD-HOUSE.

This house is not only larger, but also has a gable roof. This plate (No. 7) is made up of a sketch—front view, A; side view, B; and patterns C, D, E, F, G, H and I. Two of C, or the front, are needed. Two are also needed of D, the sides; two of G, which is only half of the roof, and two of H, which are to support the perch.

The patterns are cut the same as those for the wren-house. After laying out and sawing the parts to

size, begin assembling by first nailing the sides and ends together. The bottom is then slipped in and nailed. It will be necessary to take the partition next. Place it in the center, just half-way between the holes that have been bored, and nail from the front



and back. Then nail the roof, having it project over the same distance in the rear that it does in the front.

The supports for the perch are nailed on the side, $\frac{1}{2}$ " lower than the holes, and slightly more than $1\frac{1}{2}$ ", projecting out in front. The perch is then nailed on

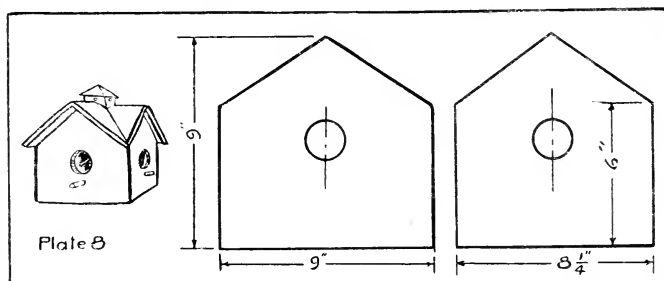
this, leaving a space of 1" between it and the front of the box.

The front view should have been mentioned; but, since we are to deal with persons who have studied no shop-drawing, it was considered best not to go into detail here and thus avoid discouragement.

What has been said about painting the wren-house also applies here.

3. OTHER BIRD-HOUSES.

In Plate 8 a third bird-house is shown. This, like the one in Plate 7, has larger openings, and is really intended for birds larger than the wren, as bluebirds, martins, etc.



The two patterns shown in Figure 8 are alike, with the exception of one dimension, and that is the width. One is 9", and the other $8\frac{1}{4}"$, so that, with $\frac{3}{8}"$ material, the base will be square. The floor is inserted the same as in the previous ones. Then it is divided into four parts by placing two partitions diagonally. For martins this may be a trifle small,

and can be enlarged in the same proportion; but for wrens the opening is merely made smaller.

No definite instructions regarding the plan for the roof seem advisable here, so it may be worked out to the best of the pupils' ability.

The cupola is added lastly. It is made with a square base, and an angular piece cut out of each side, so that it will fit snugly over each part of the roof and is bradded in place.

A very simple and effective bird-house is also made of four shingles and two pieces of plank about 4" or 5" square. Let the pieces of plank be used for the top and bottom. Nail a shingle on each of the four sides, and, after cutting an opening, we have a very attractive home for the birds—at least, it seems so to them.

Still another way is to get hollow parts of trees, and nail one end shut, or both ends if you have an opening cut in the side. Woodpeckers and blue-birds will inhabit such a home.

Tin cans can also be used to advantage.

Many avenues are possible, so let us combine and do all we can to teach the coming generation the proper relation of birds to man.

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